FLIGHT and The AIRCRAFT ENGINEER

First Aeronautical Weekly in the World : Founded 1909

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Editorial, Advertising and Publishing Offices: DORSET HOUSE, STAMFORD STREET, LONDON, S.E.1
Telegrams: Truditur, Sedist, London. Telephone: Waterloo 3333 (35 lines).

8-10, CORPORATION ST., COVENTRY. Telegrams: Autocar, Coventry. Telephone: Coventry 5210.
GUILDHALL BUILDINGS, NAVIGATION ST., BIRMINGHAM, 2. Telegrams: Autopress, Birmingham. Telephone: Midland 2971 (5 lines).
260, DEANSGATE, MANCHESTER, 3. Telegrams: Iliffe, Manchester. Telephone: Blackfriars 4412.
26B, RENFIELD ST., GLASGOW, C.2. Telegrams: Iliffe, Glasgow. Telephone: Central 4857.

SUBSCRIPTION RATES: Home and Abroad: Year, £3 1 0. 6 months, £1 10 6. 3 months, 15s. 3d.
Registered at the G.P.O. as a Newspaper.

No. 1685. Vol. XXXIX. APRIL 10th, 1941 Thursdays, One Shilling.

The Outlook

Aircraft in a Fleet Action

BOTH the Fleet Air Arm and the Royal Air Force share in the honours of the great naval victory of Cape Matapan. In fact, had it not been for the T.S.R. machines from H.M.S. *Formidable* it seems likely that instead of a resounding victory there would have been just one more disappointing incident in which the Italian warships used their speed to escape, while the British vessels toiled vainly after them. The speed of the aircraft altered the whole position, and their torpedoes so reduced the speed of the Italians that our battleships were able to come into action and use their 15-inch guns. The aircraft's torpedoes did not sink the great Italian battleship *Vittorio Veneto* outright, and at the moment of writing it is not known whether she limped home during the night or not, but the salvoes of the three British battleships blew two large Italian cruisers to pieces before they even knew that they were in danger. This would probably not have happened but for the slowing up of the whole Italian fleet by the torpedoes from the air.

In this moment of triumph we should not forget the praise due to the shipbuilders who got the new carrier ready in time to take the place of the damaged *Illustrious*. Though carriers run risks when used in waters which are within the range of shore-based aircraft, these much-discussed warships have proved their worth in the Mediterranean over and over again. It would have been a tragedy for the Allied cause if the bomb which hit the *Illustrious* had left Admiral Cunningham short a modern carrier. H.M.S. *Eagle* took part in the Taranto affair, and presumably is still based on Alexandria, but she is an old ship, and cannot be compared with the *Illustrious* and *Formidable*. H.M.S. *Ark Royal* has been based on Gibraltar.

The Blenheims of the R.A.F. also did great work, for they brought off direct hits with bombs on moving Italian warships, a feat which has been very rarely accomplished. Together with their successful aiming, one must admire the staff work and co-operation between the Services which led to a formation of Blenheims already in the air on a routine job being promptly diverted to take part in the most successful naval action of modern times. The battle took place on March 28th; it made a nice birthday present for the R.A.F. on April 1st.

The Brand of Cain

SINCE the Thirty Years' War and the brutalities of the Bavarian Count Pappenheim in the first quarter of the 17th century, Europe has seen no atrocity to equal the slaughter wrought in central Rotterdam by the bombers of the *Luftwaffe*. Since that terrible day German bombers have killed over 28,000 civilians in Great Britain and seriously wounded 40,000 more, mainly during the last eight months. Though there have been attacks on our ports and factories which have a strategic object behind them, the majority of the German bombs have been deliberately dropped on residential areas with the intention of killing civilians. That their efforts over Great Britain have not quite equalled the concentrated horror of Rotterdam is in no way due to any compunction on the part of the Germans. The criminal intention has been the same in these and in other cases.

This wholesale campaign of murder has provoked in the parts of this country which have suffered most a savage desire to do unto the Germans as they have done unto us—in plain words, to drop our bombs where they will be sure to kill German women and children and other civilians. This desire is natural: it is human nature. If there were any reasonable hope that such reprisals would make the Germans desist from their methods and so would save the lives of British women

and children, there would be a good case for a change of our policy. The demand is simply one of an eye for an eye and a tooth for a tooth, and gain on either side questionable. The object of legal punishments in any country is preventive, the prevention of similar crimes in the future. It is not vindictive retribution, which does no good to anyone. The character of the British people is not vindictive, but in this case suffering and rage have in some parts brought about a frame of mind foreign to normal British nature.

Golf and Goebbels

LAST year, when the air blitz was at its height, the Richmond Golf Club established some temporary rules to cover the unusual circumstances which might arise. Balls moved by enemy action could be replaced without penalty, but a player whose stroke was affected by the simultaneous explosion of a bomb might, for a penalty of one stroke, play another ball from the same place. The news spread to Germany, and, as was to be expected, Goebbels sneered. That sort of bravado did not impress him, and, anyway, German pilots never bombed anything but military objectives; all the now familiar rigmarole.

Superficially, there does not appear to be any very direct connection between the war, particularly the air war, and the Richmond Golf Club, except in so far as it is provided by several members of the club being familiar figures in the British aircraft industry. Actually, the association is not so very far-fetched. Hitler has come up against an unexpected obstacle in Yugoslavia. Just when he thought he had that country bluffed and bullied as he had bluffed and bullied so many other States, the bloodless revolution took place, and, overnight, Hitler found that he did not have Yugoslavia in his pocket. He discovered that the Yugoslavs, to use an expressive Americanism, don't scare worth a damn.

Still the connection between Yugoslavia and a British golf club is not very obvious. It is necessary to go back a few years, to the time when Yugoslavia bought a number of Hawker Furies. A team of Yugoslav officers came to this country for acceptance tests and other business connected with the purchase, and they were frequent guests at the golf club. We do not recall all the names, but there was General Naditch, who was Yugoslav Chief of the Air Staff at the time; there was the late Col. Stanoievitch, who was Director of Technical Development; there was Col. Bajdek, in charge of the test flying establishment; and there was Col. Ruptitch, test pilot. Since those days Yugoslavia has had a very pro-British outlook, thanks largely to her air force and to the good work done there by such representatives of the British aircraft industry as Mr. Tom. G. Mapplebeck and General Kirstitch.

In more recent times the Yugoslav air force has bought from this country Blenheims and Hurricanes, and licences for manufacture have been granted, so that it may be assumed that Yugoslavia is not ill-prepared to meet the *Luftwaffe* should the need arise. The Hurricane has plenty of range to accompany bombers from Belgrade to Vienna, and the Yugoslav air force might be expected to give a good account of itself until the R.A.F. could get to work. So there is, after all, quite a direct connection between British golf and Yugoslav air war. The great oak and the tiny acorn again.

INSPIRATION IN OILS. Portraits of two airmen V.C.s of the present war are to be hung in the ante-room of the officers mess at their respective squadrons. They are of Wing Cdr. R. A. B. Learoyd, V.C., and Sgt. John Hannah, V.C., and were painted by Mr. Frank Salisbury. Mr. F. Handley Page is here seen at the little ceremony at which he presented the portraits to the two V.C.s, who handed them over to their respective commanding officers.

War in the Air

The Great Naval Victory: R.A.F. and F.A.A. Combine: More Cities Taken: The Latest Bombs

LATER news of the great sea fight in the Ionian Sea, the Battle of Cape Matapan seems to be the accepted name for it, has emphasised still more clearly the important part played in it by British aircraft, both naval and R.A.F. Class for class, the Italian warships are faster than the British, and on all previous occasions on which something like contact has been made, the Italians have used their speed to escape from British clutches. That does not imply cowardice on the part of our enemy. An Italian fleet in being, so long as it remained in being, contained a large part of the whole British Navy in the Mediterranean, and thereby gave a more or less free hand to the naval forces of other members of the Axis in other waters. Japan, for example, may well have thought that Singapore was hers for the cost of one naval action, while the *Gneisenau* and the *Scharnhorst* felt the less anxiety for their own safety as they preyed on British shipping in the Atlantic through the knowledge that so much of the British Navy was tied up in the Mediterranean. In fact, survival was the most important strategic object of the Italian Navy, as it obviously entertained no hopes of being able to outfight and sink the British Mediterranean Battle Fleet.

At Matapan the speed of the Italian ships might once more have carried them to safety had it not been that the T.S.R.s of H.M.S. *Formidable* were still faster. The type used has not been officially stated, but we may presume that Albacores were among them. On the historic March 28th no less than five torpedo attacks were made by the T.S.R.s. The first was made at 11.30 a.m., when a possible hit was claimed on the battleship which was afterwards known to be the *Vittorio Veneto*. Very shortly afterwards the second attack was made on the same vessel, and one hit was claimed. The third attack was made in the early afternoon, and this time three hits were claimed on the *Vittorio Veneto*. Then at 3 p.m. Blenheims of the R.A.F. attacked one of the enemy squadrons with bombs and between that hour and 5 p.m. they claimed two direct hits on one cruiser, one direct hit on a destroyer, and two probable hits on another cruiser. At dusk the last two torpedo attacks were made by the T.S.R.s, and one enemy cruiser was definitely hit. At 4 p.m. Admiral Cunningham had received a report from aircraft that the speed of the *Vittorio Veneto* had been drastically reduced by the air attacks.

WELL ARMED. Among the aircraft types in the Yugoslav Air Force are Blenheims and Hurricanes. The markings are as shown in this *Flight* photograph of one of the Yugoslav Hurricanes.

The Ministry of Information remarked in its narrative: "These highly successful engagements in the Mediterranean can be accounted historic for two reasons. It is the first occasion in history in which skilful coordination of naval operations with attacks launched by aircraft has resulted in the enemy's speed being reduced and our main units being able to force action on a reluctant enemy. It is also the first occasion in naval history in which such severe losses have been imposed upon the enemy while our own forces were completely unscathed." The only British losses in the battle were two naval aircraft.

On the "Formidable"

A TELEGRAM from the British United Press correspondent who was on board the *Formidable* during the action gives the following account of the part played by the ship's aircraft:

"Our torpedo-bombing attacks against the enemy began at 11.45 a.m. At this time the *Vittorio Veneto* was firing her 15in. guns at our cruisers. She was hit by one torpedo from an aeroplane and was forced to turn away. This attack was 50 miles southwest of Crete. The *Vittorio Veneto* was then 100 miles west of the British Battle Fleet. At 12.15 p.m. the *Formidable* turned out of the battle line to fly off a second striking force and fly on the first. Soon after rejoining the Fleet we were unsuccessfully attacked by three torpedo-bombers (Italian).

"The second striking force remained in the vicinity of the Fleet until 2 p.m., when it was ordered to attack. It attacked at 2.30 p.m. Our aircraft got down low without being observed, when a destroyer in the screen opened fire. This destroyer was shot up by two of our 'planes. The *Vittorio Veneto* started to turn away, but one aeroplane got in its attack just as she turned and scored a hit with its torpedo. The second flight fired two torpedoes from a perfect position, and one was observed to hit. It is believed possible that the other also hit the battleship, but it could not be observed, as the aircraft turned sharply away to avoid anti-aircraft fire. After the attack, the *Vittorio Veneto's* speed was reduced to 10 or 12 knots.

"All the aircraft came back from their first successful search for the Italian Fleet in the morning, and were immediately rearmed and sent out again. The second striking force returned at 3.44 p.m. Reconnaissance aircraft returned at 4.14 p.m., and reported that the *Vittorio Veneto* was then making a speed of only eight knots. At dusk a third striking force flew off, which kept the enemy fleet in sight until the light began to fade, when the force began its attack. But the barrage was so fierce that they turned back for a short time, then attacked singly from widely different positions. One cruiser (subsequently proved to have been the *Pola*) was hit by a torpedo, but darkness prevented them from observing other hits."

WAR IN THE AIR (Continued)

The grand collaboration between the Navy and the Air Force in the Middle East was still further exemplified by the part played by the R.A.F. Blenheims in the Battle of Matapan. Blenheim pilots were setting off on normal raids on military objectives in Tripolitania when they received the surprising news that a large part of the Italian Navy was actually at sea. The Squadron Leader who led one of the attacks said: "The weather was very hazy over the sea, but we soon found the Italian Navy, in two groups, steaming like billy-ho for home. They began to zigzag as soon as they saw us, and their anti-aircraft guns opened up. We made a dive attack and fairly plastered them. Pilots in my squadron registered hits on one big ship, and we think other vessels must have been damaged or delayed by near misses." A sergeant pilot who scored two direct hits with heavy-calibre bombs on a very big ship said: "Though they changed formation and zigzagged quite a lot, we spent some time taking aim and made a low-level attack. I saw two of my biggest bombs hit the largest ship amidships. Clouds of black and yellow smoke issued from her for a long time, and then she stopped."

It is well known to all that to hit a warship travelling at high speed is one of the most difficult bombing feats there is. The sergeant pilot said: "It was a hefty, but agreeable, surprise when I saw those bombs hit the ship in just the place aimed for, right amidships. At first there was a normal white smoke of the bomb bursts, and then columns of black and yellow smoke shot into the air to about 2001t. For fifteen minutes after we made off, the rear gunner had a good view of the ship and gave us a running commentary. It had stopped, and he thought it had started listing before he lost sight of her." Another formation, led by a D.F.C. Flight Lieutenant, discovered an enemy battleship, escorted by three cruisers and six destroyers, fleeing for home. The Flight Lieutenant said: "The enemy fleet appeared to be in great confusion, zigzagging violently, and now and again one would get in another's way. We bombed and added to the confusion, but though we saw no hits there were plenty of near misses, and when we left the enemy was busy laying a smoke screen."

All R.A.F. aircraft taking part returned undamaged.

Other Successes

THE Fleet Air Arm scored another success, this time in the Red Sea. An R.A.F. reconnaissance aircraft reported that an Italian destroyer of the *Pantera* class, of 1,526 tons, had steamed out from the Eritrean port of Massawa. As that port seemed likely to fall into British hands at any moment (and may be held by our troops by the time these words are published), the Italian Captain evidently thought that he had better go while the going was good. It did not prove to be too good. The destroyer was located, attacked and sunk by naval aircraft. Another good example of co-operation between the two flying Services.

Asmara and Diredawa are two more subjects of conversation which must add to the geniality of the meeting of Mr. Matsuoka with Signor Mussolini. Asmara, the capital of Eritrea, surrendered without resistance after the British forces had captured Keren. The surrender was doubtless wise. During the siege of Keren the good people of Asmara had seen something of the enterprise of the R.A.F. and S.A.A.F. in bombing military targets in their vicinity. The Keren garrison, in a bad state of demoralisation, rushed right through Asmara, and then turned off to the south in the direction of Abyssinia without making any effort to protect the port of Massawa. Our aircraft pursued the fugitives and harried them relentlessly.

Closing In

THE capture of Diredawa, on the railway between Addis Ababa and Djibuti, was another important success, in which our aircraft played a notable part. The capital of Abyssinia was thereby cut off from its one route to the sea, and the Allied forces began to close in on it from all sides. When the British troops entered Diredawa they found the Italian residents being attacked by an armed band mostly composed of African deserters from the Italian Army. Evidently the Abyssinians have not learnt to love the conquerors who attacked them without any justification and used mustard gas dropped from aircraft to complete the defeat of the Ethiopian troops. Such evil deeds have a way of recoiling on the heads of the criminals who perpetrated them.

Turning for a moment from the sunny shores of the Mediterranean to the grey of the English Channel, information reached the Air Ministry that the two fast and powerful German warships *Scharnhorst* and *Gneisenau*, which had been out in the Atlantic raiding shipping, had entered the harbour of Brest. One was in dry dock and the other alongside a quay. The Bomber Command took prompt action. Our aircraft came in from every quarter to criss-cross their objectives with sticks of bombs, among which were some of the most massive used against such a target. One of the pilots flew over the docks twelve times, "waiting to get the flares just right," as he said, before he dropped his bombs. Another made eight runs; a third spent 52 minutes on his bombing, and nearly every pilot made more than one attack. This had to be done while all the ground defences at Brest kept up an incessant barrage, to which the pom-pom guns on the ships added their menace. There were several large and persistent fires left burning when our aircraft came away, but, as might be expected in a raid on such a target, observers for the most part reported the flashes of their bomb bursts stabbing through the darkness. No direct hits on the battle cruisers are claimed, but there is no doubt that their berths were very thoroughly plastered.

However, if the two battle cruisers survived unharmed such a fierce attack (which is by no means a certainty), a large German destroyer was not equally fortunate. Blenheim bombers were out on reconnaissance one afternoon off the Frisian islands when they sighted a German convoy escorted by two large destroyers. A stick of bombs straddled the one which was bringing up the rear of the convoy, and she slewed round and when last seen was listing heavily to port with a volume of black smoke pouring from her stern.

A new type of bomb has been brought

FROM INFORMATION RECEIVED: Just as important as hitting the target is the valuable data which the bomber crew brings back from its raid over enemy territory — information which will almost certainly be of vital importance in the next raid. In this picture, taken in the interrogation room at a Bomber Command station, bomber crews who have just returned from a raid are making their report to Intelligence Officers whose duty is to elicit every possible scrap of information gleaned during the flight. Cups of tea and cigarettes refresh the airmen during the conference.

WAR IN THE AIR (Continued)

into use by the Bomber Command, and was first used in a night attack on industrial centres in Emden. The new weapons have five times the blasting effect of any dropped previously by the R.A.F. They are filled with an extremely effective explosive capable of destroying buildings over a wide area, and the concussion would be felt many miles away.

The Royal Air Force came into being on April 1st, 1918, and on the twenty-third anniversary Air Chief Marshal Sir Arthur Longmore, G.C.B., D.S.O., Air Officer Commanding - in - Chief Middle East, broadcast from Cairo. In the course of an interesting speech he traced the growth and expansion of the R.A.F. and also gave a number of personal experiences of pilots who were the pioneers of Service aviation. The Air Chief Marshal recalled that our present Prime Minister, Mr. Winston Churchill, had always taken a very keen interest in the Air Force and given tremendous assistance to the development of the Service in its very early days.

Turning to the present war, he referred to the fact that over one thousand Italian aircraft had been destroyed in the Middle East, and paid a great tribute to R.A.F. fighters at Malta, who had put up a magnificent defence. Then he went on to say: "Co-operating with the Navy, the R.A.F. aircraft allotted for sea and enemy port reconnaissances have done splendid work. Immediately preceding last week's naval victory, a Royal Air Force sea reconnaissance aircraft had located the enemy forces and continued to report their movements. R.A.F. bombers, acting on this information, attacked and successfully hit and crippled one of the cruisers, possibly two, and one of the destroyers out of those finally disposed of by Admiral Cunningham's forces in his great victory on which the R.A.F. Middle East sends its expression of admiration. "Many of the bomber crews who took part in that operation were only a few weeks ago helping our Army in their Libyan victory—a good example of the advantages of a flexible Air Force not tied to one rôle, but available for employment where most needed at the time. We can look back on these achievements with some satisfaction, but it is what lies ahead that matters in war—we have many storms to weather yet. To the Royal Air Force in the Middle East I send my anniversary greetings and my appreciation of their great and successful efforts on all fronts. Good flying to you all through the clouds and sand ahead. Just one more message, and that from the Royal Air Force Middle East to the Royal Air Force at home: 'Birthday greetings, good luck and our congratulations. We know how much you did to save England last summer and how greatly you will contribute to the final victory.'"

The Italian destroyer mentioned above was not the only one which tried to escape from Massawa. Later news has told of two more, and both were faithfully dealt with by aircraft of the Fleet Air Arm. The activity of that arm in the Red Sea suggests that perhaps H.M.S. *Eagle* has moved down there since the *Formidable* joined the Fleet at Alexandria.

It has been announced that a good deal of the air work in the eastern parts of the East African theatre has been carried out by R.A.F. squadrons flying across from Aden.

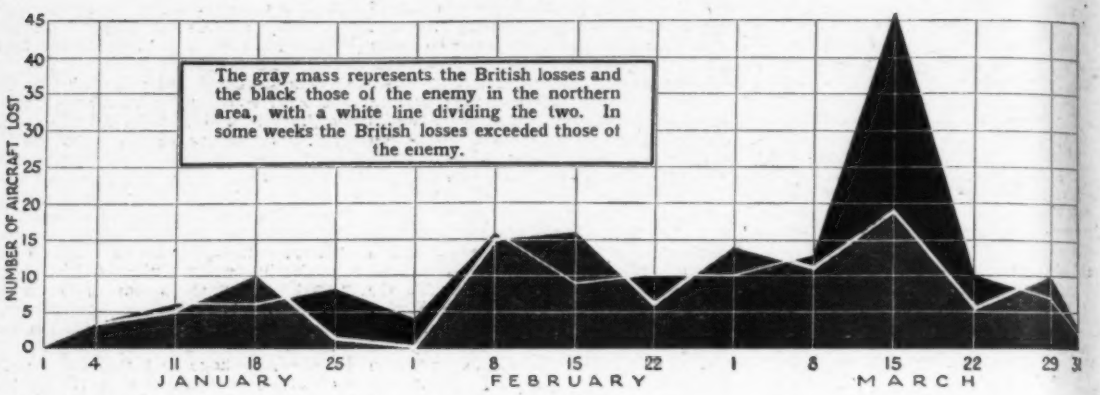
The Germans had evidently managed to land considerable mechanised forces at Tripoli, and they have infused some spirit of enterprise into the Italians there. The result is a British evacuation of Benghazi, which is distinctly annoying. We have learnt by experience that General Wavell will never sacrifice the substance for the shadow, and he is not the man to lose valuable British troops by holding on to a place which gave no good opportunities for a successful defence. He withdraws, to strike again at his own good time. He did the same thing at Berbera some months ago.

We may hope that the real meaning of this evacuation is that the bulk of our troops are needed more urgently elsewhere, first, in finishing off the last Italian resistance in East Africa, and, secondly, in preparing help for the Greeks. We may also hope, with some confidence, that the naval victory will make it much harder for the Germans to maintain or reinforce their contingents in Tripolitania. While the Italian fleet was in being it was obviously impossible to string British cruisers and destroyers out along the African coast to watch for enemy transports. For the future it should be safe to go much farther in this direction.

CONVINCING ARGUMENTS. The belief that bombs, more bombs and still more bombs are the only arguments that the Nazis are capable of understanding is widely held and Bomber Command continues to do better and better work in "putting over" this emphatic form of reasoning. Here we see a bombing-up party hoisting another "message" into the rack for immediate delivery.

THREE MONTHS' AIR LOSSES

British and Enemy Losses Compared : Italian Collapse Strikingly Shown


The gray mass represents the British losses and the black those of the enemy in the northern area, with a white line dividing the two. In some weeks the British losses exceeded those of the enemy.
NUMBER OF AIRCRAFT LOST
0
5
10
15
20
25
30
35
40
45
1 4 11 18 25 1 8 15 22 1 8 15 22 29 31
JANUARY
FEBRUARY
MARCH

ON this page we give in the form of graphs the losses in aircraft by both sides during the first three months of this year. One graph deals with the Northern area of hostilities, Great Britain, the seas round the coasts, and Germany and enemy-occupied countries. These figures do not include the enemy aircraft shot down by the Fleet Air Arm or by ships at sea, because the Admiralty only publishes such figures at infrequent intervals, and makes no clear distinction between machines known definitely to have been destroyed and those seriously damaged. The Air Ministry figures take no account of machines seriously damaged and unlikely to have regained their bases. The other graph deals with losses in the Mediterranean and Northern and Eastern Africa; in fact, all areas comprised in the R.A.F. Middle East Command, but again taking no account of enemy machines shot down by the Fleet Air Arm or by the fire from ships. The number of these losses is not great, though the destruction of single machines which have tried to shadow the British Fleet has been an important matter.

The Effect of Weather

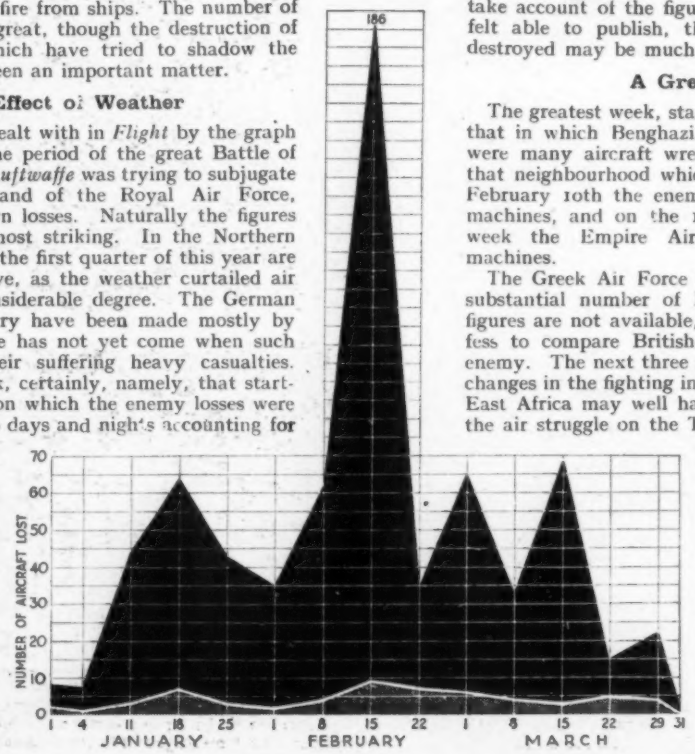
The last period dealt with in *Flight* by the graph method included the period of the great Battle of Britain, when the *Luftwaffe* was trying to subjugate the Fighter Command of the Royal Air Force, regardless of its own losses. Naturally the figures shown then were most striking. In the Northern area the figures for the first quarter of this year are much less impressive, as the weather curtailed air operations to a considerable degree. The German raids on this country have been made mostly by night, and the time has not yet come when such tactics lead to their suffering heavy casualties. There was one week, certainly, namely, that starting on March 9th, on which the enemy losses were unusually high, two days and nights accounting for no fewer than 26 aircraft. But for the most part the figures have been low. Sometimes the weekly figures of British losses have exceeded those of enemy losses. That is to be explained by the daylight sweeps which the R.A.F. has made across Northern France, when certain risks had to be run and when fighter pilots who jumped with their parachutes came down on enemy territory—though these graphs do not deal with personnel, only with aircraft.

The figures for the Middle East are much more exciting, for they show in the clearest manner the complete mastery which the Air Forces of the British Empire established over the *Regia Aeronautica*. The graph does not only show machines shot down in air combat, but also those captured on the ground, which were mostly in a very damaged condition, sometimes because the Italians set them on fire before evacuating their aerodromes. The authorities of the Middle East cannot yet be quite certain of the numbers of enemy aircraft damaged or destroyed by our own bombing raids on aerodromes still in enemy hands, e.g., in Sicily and the Dodecanese Islands. The graphs can only take account of the figures which the Middle East felt able to publish, though the actual number destroyed may be much greater.

A Great Week

The greatest week, starting on February 9th, was that in which Benghazi was captured, and there were many aircraft wrecks on the aerodromes in that neighbourhood which fell into our hands. On February 10th the enemy lost no fewer than 100 machines, and on the 13th another 57. In that week the Empire Air Forces lost only nine machines.

The Greek Air Force has accounted for quite a substantial number of Italian aircraft, but total figures are not available, and the graphs only profess to compare British losses with those of the enemy. The next three months may well see great changes in the fighting in the Middle East. That in East Africa may well have come to an end, while the air struggle on the Thracian frontier of Greece will perhaps reach great intensity. The air may play a major part on that front.



This graph gives the results in the Middle East, and again the gray mass represents the British losses and the black mass those of the enemy.

CANADIAN TRAINING : R.C.A.F. pilots and Army personnel take part in exercises. The realism of the Army steel helmets is somewhat spoiled by the armchair radio ground station on the right.

AIR and ARMY in the FUTURE

A Sorry Tale from France : Hopes for Better Things

By MAJOR F. A. de V. ROBERTSON, V.D.

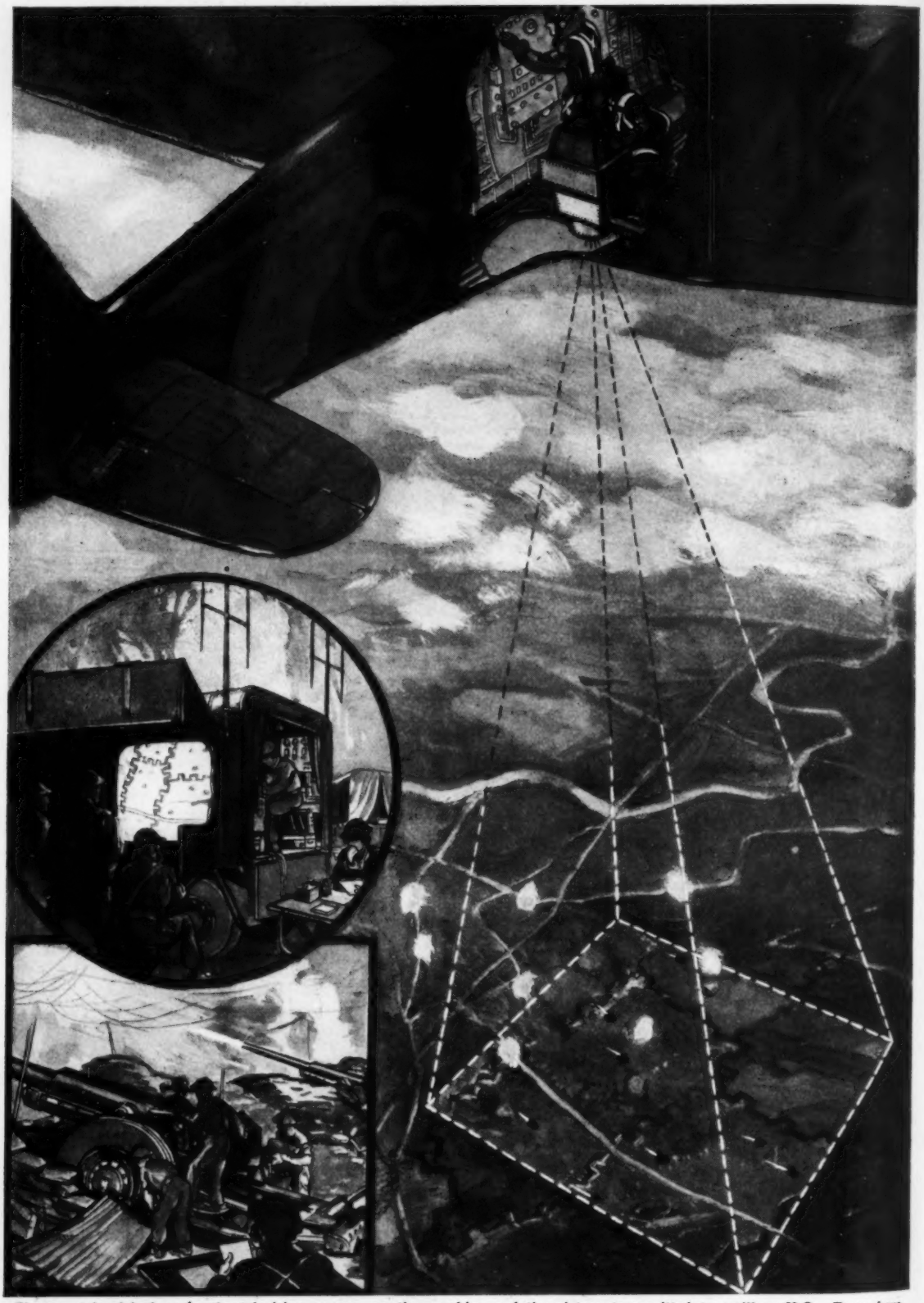
FROM 1912 to the end of 1917 the Royal Flying Corps was part of the Army, and when it went overseas in August, 1914, its function was reconnaissance. At first it was merely tactical reconnaissance on the front of the Army, and it was not long before the Corps performed a service of first-class importance by detecting and reporting the outflanking movement of General von Kluck's force. Had this movement not been seen in time, the Germans might have won that war in their first rush on Paris.

Photography and wireless are the two handmaids of reconnaissance, and as they were developed the usefulness of air reconnaissance rapidly increased. The development of wireless soon made possible the next step, namely, spotting for the artillery. As a military operation, this is quite different in kind from tactical observation of the movements of the enemy, but to the airmen the two seem kindred, in that in both cases the airmen do not do any fighting, but merely use their eyes and send reports which enable the ground troops to fight with good effect. Bombing and air combat are the two operations in which the aircraft itself is used as an engine of destruction. In a land campaign however, air combat is never an end; it is only a means whereby either reconnaissance or bombing is made practicable and comparatively safe. Not until the Fighter Command hurled back the assault on this country by the bombers of the *Luftwaffe* in the summer of 1940 did air fighting become, so to speak, an end in itself. In that struggle no marching troops were engaged. The idea may be expressed in another way; if the Germans had no aircraft at all the British Army would have no need for fighters, but it would still need reconnaissance aircraft and also bombers. The bombers are only needed when the target is outside the range of the artillery, but the reconnaissance machines are needed by the Army all the time.

Pursuing this train of thought, in the inter-war years the Air Ministry recognised the need of the Army for aircraft trained in tactical reconnaissance, and provided them. The units were called Army Co-operation Squadrons. It was even admitted that these squadrons must work under the orders of Army Generals commanding corps and divisions. The officers in these squadrons were well and carefully trained in their very specialised duties, which are quite unlike any other form of Air Force work. The School of Army Co-operation at Old Sarum was (and presumably still is) a very well-organised institution and the training given there was extremely sound. The officers (who had to be both observers and pilots, and rather more particularly observers) were drenched, as one might say, in Army

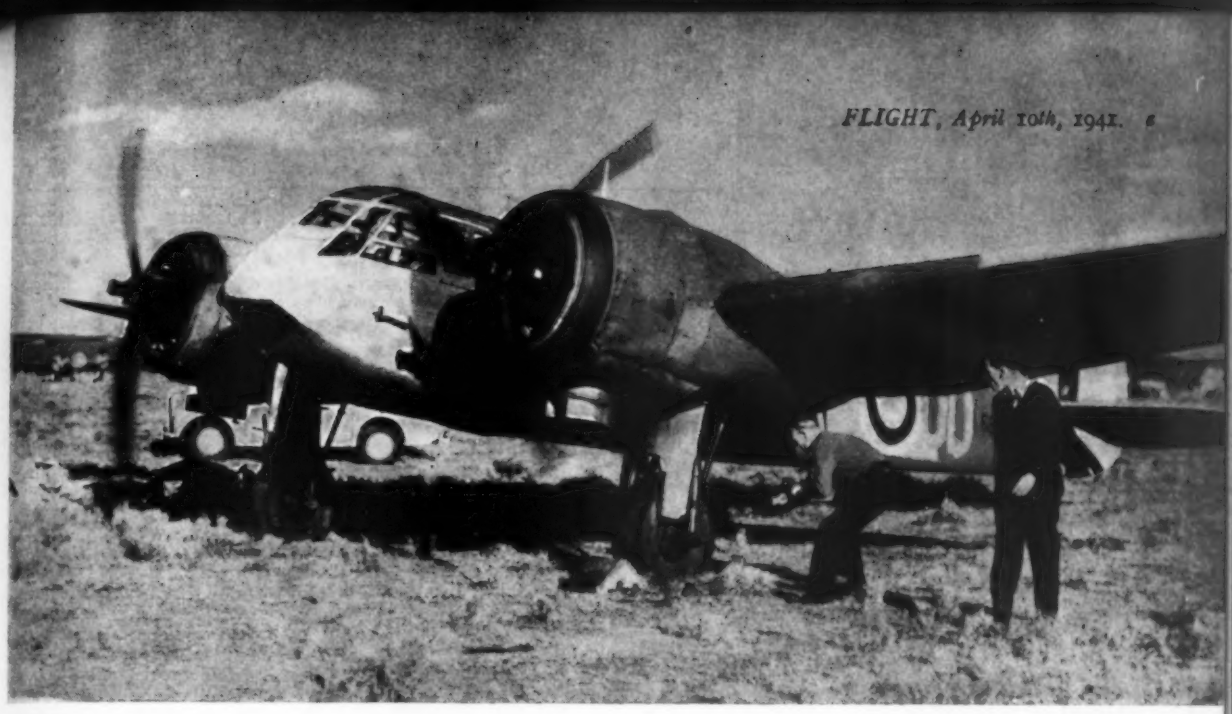
TO DROP ON OWN TROOPS : Supply-dropping by parachute containers to forward or isolated troops is one of the important functions of the Westland Lysander.

ARTILLERY CO-OPERATION AND TELEVISION



The target is picked up by the television camera on the machine and the picture transmitted to artillery H.Q. From here corrections are sent to the guns by telephone. There is no record of this system having been used in battle yet.

"Flight" copyright sketch by R.E.P.



ON ACTIVE SERVICE : Short-nosed Blenheims have been used extensively both for bombing and reconnaissance to help the Greek army in Albania.

tactics, and the longer they remained at this work the more expert they became. Most of them found the work so absorbing that they wanted to remain at it, but of course they were often transferred by the Air Ministry to other branches of Air Force work.

The Air Ministry admitted in general terms that an Army in the field would need bombers as long-range artillery and fighters to protect the other classes from enemy fighters, and it proposed to supply them out of its own pool. It did not, and it does not, admit that the Army needs a contingent of either of these two last-named classes permanently attached to it and specially trained to work with it. The argument is that bomber crews are trained to find a target and hit it, and it does not matter to the crews whether it is the General Staff or the Air Staff which wants that target destroyed. Likewise fighter pilots will fight with equal efficiency whether they are working in the interests of the Air Ministry or of the War Office.

Strategical Reconnaissance

There is, however, another need of the Army which, it appears, was only recognised rather late in the day, namely, the need for strategical reconnaissance far behind the enemy's front lines. The Lysanders (or whatever might be the current type) of the Army Co-operation Squadrons could not undertake this work, as their machines were not suited for it. The work would have to be done by machines of the medium bomber class, though when they were engaged on it they would not be working as bombers but as reconnaissance machines. Before the present war broke out a small number of squadrons of medium bombers (Blenheims, to be exact) were put through a course of training in this work. Photography has always been acknowledged to be one of the jobs at which bomber crews must be expert. It is doubtful whether practice in photography does quite meet the case. One would imagine that for strategical reconnaissance a certain special knowledge of military matters would be highly desirable, though admittedly the observers would not need such detailed knowledge as is necessary in the case of tactical reconnaissance. Movements of armies are more easy to recognise than movements of battalions and field batteries.

In a recent issue of *Flight* some account was given of the composition and doings of the Air Component which accompanied the B.E.F. to France before the Germans advanced through Holland and Belgium to the conquest of France, and also of the Advanced Air Striking Force which was later combined with the Air Component to form a new Command. To be frank, the story does not make a very creditable record. During this war there are many ways in which the Air Staff has shown that it is fighting with its brains, but its relations with the Army is not one of them. That a major reorganisation should take place during a campaign shows, at the very least, lack of foresight. That, at a time when we were all boasting that unity of command had been achieved without having to wait three years for it, an Air Officer Commanding-in-Chief should be placed alongside the Commander-in-Chief of the B.E.F. indicates muddled thinking somewhere. Perhaps some authority could explain what were the precise relations between Air Marshal Barratt, the A.O.C.-in-C., and General Vuillemin of the *Armée de l'Air*, or between the former and General Gamelin, who was the supreme Commander of the Allied land armies, but those relations are not obvious to the ordinary student. To the actual working of the Air Component the appointment of the A.O.C.-in-C. made very little difference, and to that extent the appointment appears to have been superfluous. The parts to be played by the two bodies, Air Component and A.A.S.F., were radically different, the one being concerned purely with work for the Army and the other (theoretically) with attacking targets in Germany on behalf of the Bomber Command; and therefore the partial amalgamation of the two was hardly logical. The lack of plan in the new Command cannot be condoned by saying that as the B.E.F. was at first facing

PHOTOGRAPHIC RECCO : The easily removed side panels of the Lysander make the installation of cameras and such-like very simple.

AIR AND ARMY IN THE FUTURE (Continued)

INDOOR BATTLE: The Haskard target used for army co-operation training. Over a model landscape, tanks, guns and columns move as if in action.

a neutral frontier its Air Component could not be very active, while the A.A.S.F. squadrons were forbidden by a Cabinet decision from striking at Germany at all until Holland and Belgium had been invaded. It is the Cabinet and not the Air Ministry which must be blamed for not having sent every available bomber against the troop trains which were bringing German divisions back from Poland to the West.

When the German armies moved forward, the British Expeditionary Force had every reason to feel that it was not adequately supported in the air. Not the slightest slur is implied on the gallantry of the squadrons in either body on the Continent; they were as gallant as any in the R.A.F., but they were given a hopeless task. In particular there was a horrible shortage of fighters. Of course, the governing consideration was that the air defence of Great Britain must not be crippled, and it is certain that at that time the R.A.F. did not possess as many fighter squadrons as was desirable. None the less, what happened was exactly what *Flight* had for years past prophesied would happen, namely, that for lack of foresight the Army would find itself short of fighters when the emergency arrived. It is generally conceded that the rapid success of the German armies in the Battle of France was due to the co-operation between the mechanised columns and the dive-bombers. The answer to the dive-bomber is fighters. The Ju 87 cannot survive if there are plenty of fighters in the air against it. As was proved later on, even large escorts of Messerschmitts cannot enable it to succeed if it is resolutely tackled by such types as Hurricanes and Spitfires. In the Battle of France it was escorted by swarms of German fighters, and there were only six fighter squadrons with the Air Component and five with the A.A.S.F. (and not all of those at the start) to oppose them. No wonder that the Army felt that it had been let down, and started to demand the right to raise its own squadrons. Dependence on the generosity of the Air Ministry had, from the Army's point of view, proved to be leaning on a broken reed.

As a result there were conferences and consultations between the General Staff and the Air Staff. The result of these cogitations was that the R.A.F. formed a new Command, entitled the Army Co-operation Command, with an A.O.C.-in-C. at its head. Air Marshal Barratt was made the first A.O.C.-in-C., and it would appear at first sight that the new Command was, in the main, a development of his previous Command, the Air Force in France. Actually the differences between the two are considerable. The new Command has two Groups, one of which is in charge of training for Army work. The Chief Staff Officer of the Command comes from the Army and not from the Air Force, and the staff is compounded of officers from both Services. At the same time, it has been arranged that there shall be R.A.F. officers on all important Army staffs, as well as Army officers on the staffs of the two Groups in the new Command. The object of the Command is to ensure that there shall be an intimate understanding by both Services of the needs, powers and limitations of the other. For instance, some Army commanders in the past have shown a tendency to ask their aircraft to do any job which for the moment is proving a difficult nut for ground troops to crack. They have on occasions desired their Lysanders to make dive-bombing attacks on enemy positions. It is not beyond the powers of the Lysanders to carry out such attacks; in fact, they practise them. But it is a very extravagant use to make of machines (never superabundant) whose speciality is reconnaissance, and it may have the result that, shortly afterwards, the General in question is left without vital information because of casualties among his Lysanders. It is, of course, highly desirable that General Officers should learn to appreciate such points. In some ways the Army Co-operation Squadrons are like the Royal Engineers; for the latter are trained to fight, but should never be used as fighting infantry except in absolute emergencies.

Even more important is it that the Air Force authorities should grasp the needs of the Army and the necessity of meeting them. Some Air Force officers, but probably not all, understand the basic principle that when the Army is engaged in serious battle, its call for bombers must take precedence of the attacks on enemy production which the Bomber Command

HOOKED: A Westland Lysander of the Middle East Command picking up a message in the Western Desert.

AIR AND ARMY IN THE FUTURE (Continued)

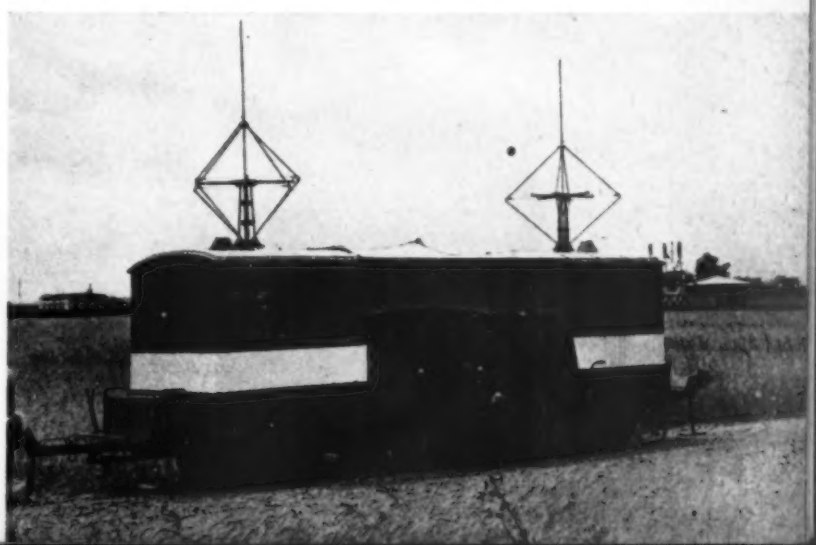
THE FOG OF WAR: United States Army Air Corps machines laying a smoke screen to cover the movements of tanks.

regards as its speciality and in which it is chiefly interested. As for fighters, while the safety of Great Britain must be the first and most important charge on the Fighter Command, the Army must have enough protection in the air to enable it to achieve its purpose. It would be an exaggeration to say that the defeat of the French Army and the loss of all the equipment of the B.E.F. (in addition to 30,000-odd men) was due to the immunity with which the Stukas were able to clear away resistance to the advance of the German tanks, but it is certain that a sufficient force of fighters in France would seriously have interfered with the operations of the Stukas. In fact, considering how the Fighter Command dealt with those same Stukas during the evacuation from Dunkerque, it does seem a possibility that France would not have collapsed so soon if the Allied armies had been properly supplied with fighter aircraft.

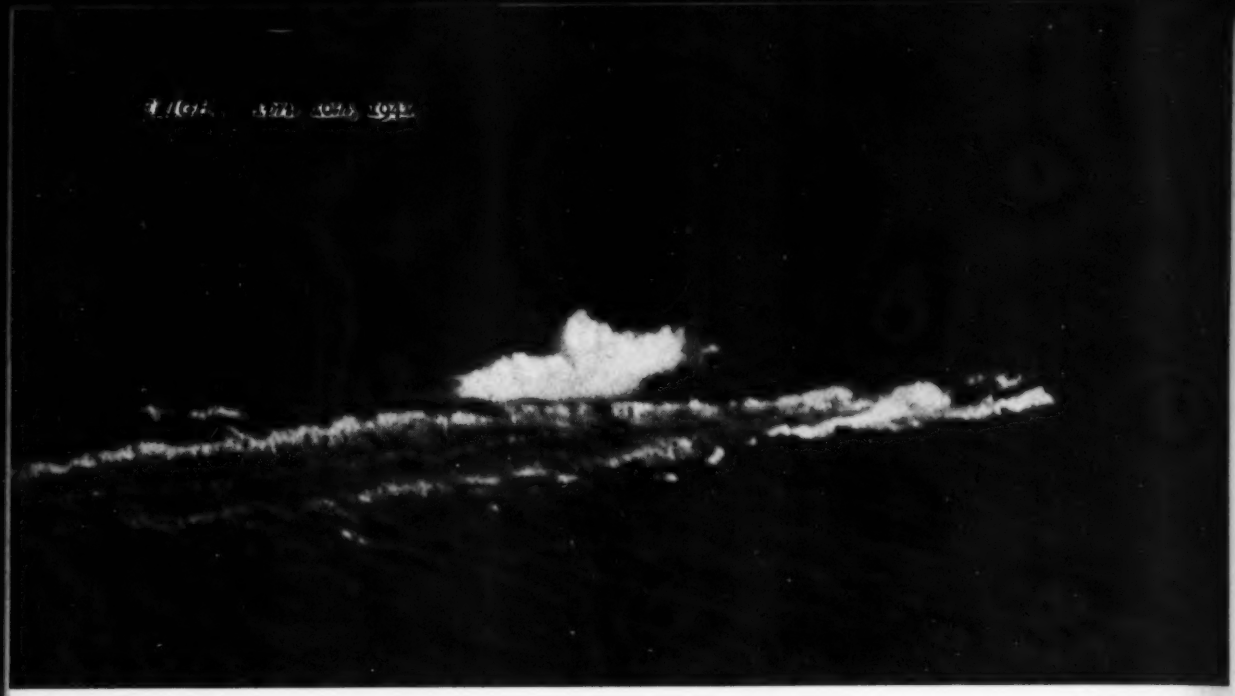
Looking Ahead

In the future it will be the business of the Army Co-operation Command of the R.A.F. to see that the Army is never again left short of any necessary class of aircraft. While the war continues fighter aircraft are being turned out from the factories as fast as Lord Beaverbrook can contrive. "Spitfire Funds" help to pay the bill, but neither they nor the Army Co-operation Command can get the machines turned out faster or in greater numbers. We must hope, and, in fact, we may assume, that the General Staff is satisfied that when next the Army begins to fight it will not be short of any essential air assistance. It has obviously agreed to the Air Ministry's contention that when the Army is only standing at the ready, as it is doing at present, it would be wasteful to keep so many squadrons of bombers and fighters on the ground because they either belonged to the Army or had been allocated for work with it. If the next land fight should be dealing with a German invasion, every squadron of the R.A.F. in this country will be helping the Army to repel the invader, and the staff of the A.C. Command will, we have no doubt, be able to direct R.A.F. energies into the best channels. It has not been explained whether in such a case the A.C. Command would supersede both the Bomber and Fighter Commands and issue orders direct to the squadrons which normally work under those two bodies. Presumably not. One cannot safely change staffs entirely in the middle of a fight; but one may presume likewise that all requests or demands from the A.C. Command would be promptly met by the Commanders-in-Chief of the other two. The information as to where the danger was most critical would naturally come direct to the Army, and the A.C. Command would pass on the request for (say) three squadrons of fighters to fly at once to Blankshire. When (we decline to say "if") the Army moves overseas once again, we may now feel confident that it will not again be let down by the lack of numbers in its Air Component, either of fighter or of bomber squadrons.

It is extremely probable that there will be need for the Army Co-operation Command to prove its utility after the war. If one may guess the future from the experiences of the past, there may well be a strong inclination to cut our forces down once more. In the ensuing struggle with the Chancellor of the Exchequer (who may then not be a former Secretary of State for Air) the Fighter Command will naturally be in a strong position for demanding the minimum number of squadrons which it considers desirable. British taxpayers have learnt by a nerve-racking experience how much they owe to that Command. Then the danger will arise that the claims of the Army will be overlooked. It may sound paradoxical, but it is true, that in time of peace it is the Army, not the Air Force, which is the Cinderella of the Services in the eyes of the Treasury. A War Office demand for fighter squadrons over and above the pound of flesh demanded by the Fighter Command might well be very coldly received by the pundits of the Treasury. That will be the time for the Army Co-operation Command to make its weight felt. The Treasury may say that these fighters are not part of the Army and will not be paid for in Army estimates, and they are surplus to the requirements of the Fighter Command; therefore they must be an extravagance which the country cannot afford. But the demands of a Commander-in-Chief cannot be lightly brushed aside even by the Treasury. All who are sensible enough to be interested in the defence of the country should rejoice that at the head of the new Command there is, not a mere A.O.C., but an A.O.C.-in-C. Those last three letters may make all the difference to our early fortunes in (what we fondly hope will never happen) the next war.



ACHTUNG! ACHTUNG! A German radio trailer operating between the *Luftwaffe* and army.



"Flight" photograph.

GOEBBELESQUE BULLSEYE : The burst of a bomb which has missed its mark.

THEY CAN TAKE IT

Armoured Target Boats for Bombing Practice

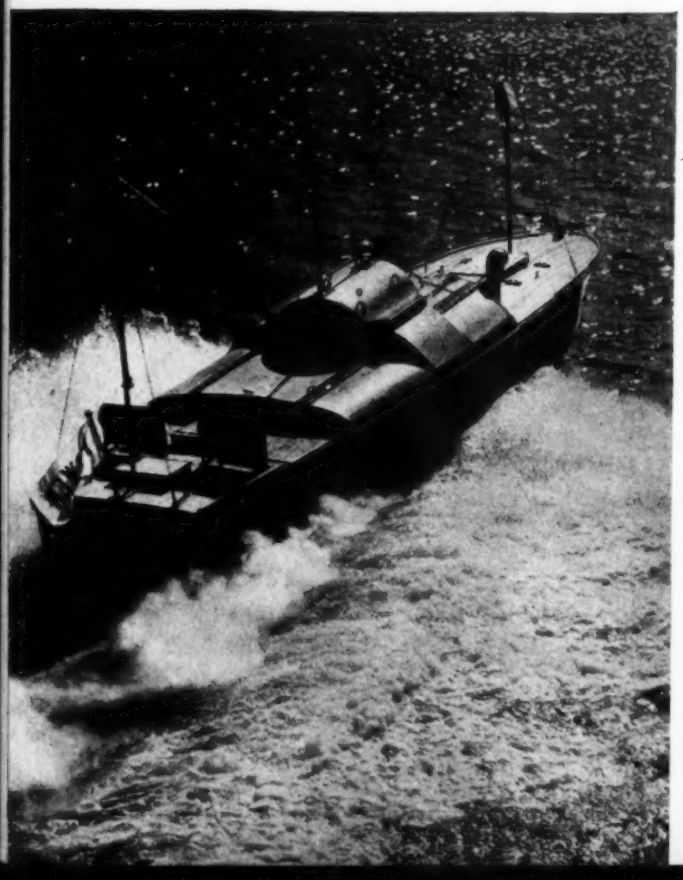
FROM an idea originating in the brain of A/C. Shaw, better known as Lawrence of Arabia, the target boat has been designed and improved by the British Power Boat Company. For some years now the R.A.F. has had the advantage of these boats for practice bombing. True it is that only practice bombs of 8½lb. weight can be dropped, but the use of missiles of heavier calibre involves the operation of wireless-controlled craft for the purpose. Some years ago the old dreadnought, *Agamemnon*, was so equipped, and it was something rather marvellous to watch this huge craft changing course and speed without a soul on board. The expense of these radio-operated ships is, of course, pretty well prohibitive, but pukka bombs of any weight or type can be tried out.

The armoured target boat as used by the R.A.F. is a triple-engined, triple-screw 40-footer. Beam is 8ft. 6in., draft 3ft., and displacement 7½ tons. The three engines are all Power-Meadows of 100 h.p. each, giving a maximum speed in the neighbourhood of 23 knots.

Crew Protection

To make these boats bomb-proof an ingenious compromise has been evolved. Armouring the whole craft would make it hopelessly top-heavy, and it would capsize on the most open turn. The crew and all vital parts are, therefore, concentrated amidships and hooded with armour plate varying between ¼in. and ½in. thick. This armour-plate hood is made further resistant to impact by being mounted on rubber buffers.

The remainder of the hull is unprotected, and direct hits missing the plated section go straight through and out of the bottom. There are, however, large areas packed with onazate to ensure ample reserve of buoyancy. Onazate is extremely light, one-fifth the weight of cork, and is basically made from rubber frothed up with hydrogen. While, of course, this style of cruising can never be very pleasant for the crew, many safeguards other than the armouring are employed for their safety. Gas masks are used as a protection against the stannic acid fumes of the bursting bombs, and it has been found that wearing a solar topee counteracts, to a



BUILT TO BE BOMBED : A close-up of an armoured target boat designed and built by the British Power Boat Co.

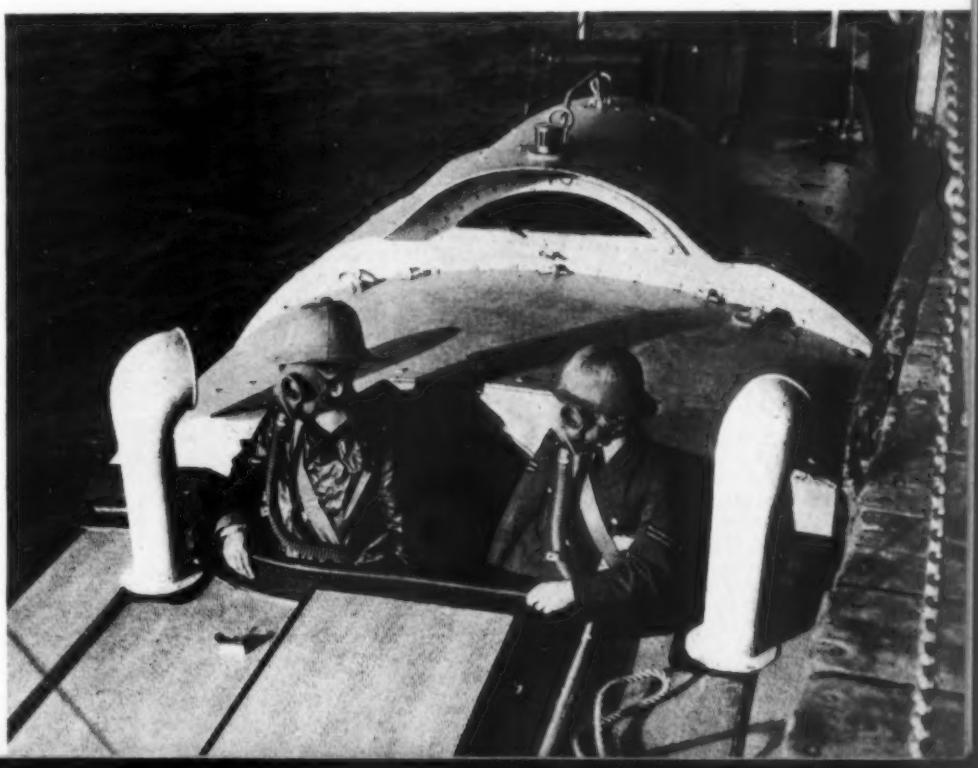
"Flight" photograph.

ELUDING THE DIVE-BOMBER: An "unlimited" course being steered by a target boat.

very large extent, the concussive effect of a direct hit on the protective plate.

Necessarily, the view from the cabin is very restricted, only a small segment of bullet-proof glass is provided fore and aft for the coxswain. This lack of view is to some extent made up for by the ease of manœuvre provided by the three independent engines and screws. Obviously, bombing only takes place in open waters, and a look-out can be posted when navigating close inshore and no bombing is in progress.

Normally a crew of three is carried—coxswain, wireless operator and deck hand. The wireless operator is carried in order that messages can be received changing the type of manœuvring to suit the experience of the air crew practising at the moment. New hands, for instance, get a gentle straight course, while the older customers get an "unlimited." Another duty of the radio man is to keep in touch with an attendant pinnace in case a direct hit does the unexpected and causes serious injury to one of the members of the crew or to the hull.



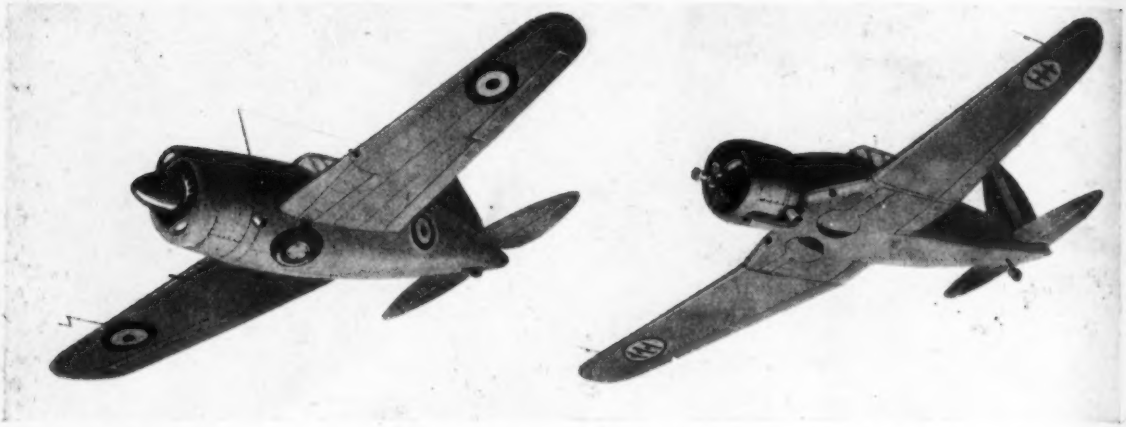
MASKED ANONYMITY: Two members of the crew wearing their gas masks and solar topees. The area and thickness of the armouring can be clearly discerned.

"Flight" photograph.

Fourteenth of the Series

FRIEND or FOE?

American and Italian Single-seater Fighters : Buffalo and G 50

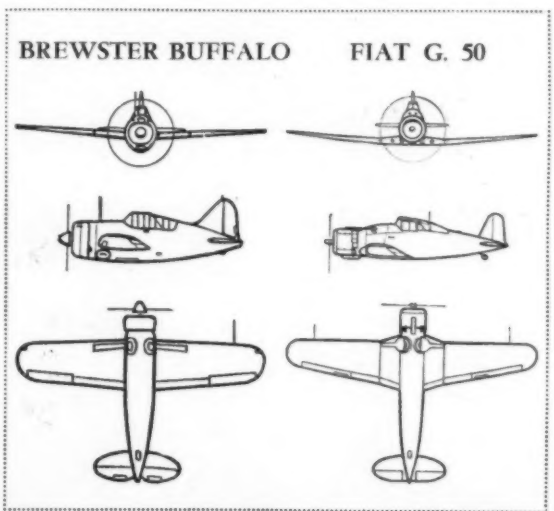


Brewster Buffalo. Mid-wing, moderate dihedral from roots, slight taper on both edges, rounded tips. Radial engine. Short, tubby fuselage with enclosed cockpit amidships; wheels retract inwards into underside of fuselage. Elliptical tailplane; straight sloping leading-edge to fin and rounded trailing edge to rudder.

Fiat G 50. Low-wing; anhedral to upper surface only of centre-section (giving very thick roots) which also tapers sharply on both edges, outer panels have moderate dihedral and taper on trailing edges to rounded tips. Radial engine. Hump-backed fuselage, Undercarriage retracts inwards. Elliptical tailplane.

THE Brewster Buffalo is a typical example of the American single-seater fighter which is now augmenting the Spitfires and Hurricanes of the R.A.F. in increasing numbers, and its blunt nose and fat fuselage will no doubt be seen in certain parts of the country contrasting with the sharp-nosed slenderness of the familiar British machines. Somewhat similar in general appearance to these radial-engined Americans is the Fiat G 50 which is superseding the Cr 42 biplane in the fighter squadrons of the Regia Aeronautica, and is, as yet, far more frequently encountered than the appreciably cleaner and faster Macchi C 200.

Although its blunt entry and deep oval fuselage, accentuated by the abnormally low aspect-ratio of its fin and rudder, give the Buffalo an extremely short, tubby appearance (especially from a side view), it is a very well streamlined job, and has a maximum speed in excess of 300 m.p.h. Its wings, which have a moderate dihedral from the roots and a slight taper on both edges to fairly broad, rounded tips, are set a little below the centre-line of the fuselage, but still come in the mid-wing category. They are, incidentally, mounted well forward, thus stressing the snub-nosed characteristic imparted by the big radial engine. The transparent top of the pilot's cockpit, which is faired smoothly into the fuselage, extends well back, almost, in fact, to the root of the leading-edge of the fin which slopes sharply back, and, with its rudder, provides vertical surfaces of abnormally low aspect-ratio. The tailplane is elliptical but with a shallow bite in the centre of the trailing-edge. The widely spaced cranked legs of the undercarriage fold inwards into the undersides of the wings, carrying the wheels into circular recesses in the belly of the fuselage.



Turning now to the Fiat G 50, the wings are of unusual design. What may be termed the wings-proper are attached to a centre-section which not only tapers sharply on both edges but which tapers in section, from a very thick root, on its upper surface only. This gives the effect of a wing cranked on its upper surface only and having a normal dihedral beneath. The wings-proper, outboard of this unusual centre-section, have a straight leading-edge and a tapered trailing edge. The undercarriage is retractable and folds inwards. It may or may not have fairing plates attached to the outer sides of the single oleo legs. The underside of the fuselage makes a clean curve from cowling to tail, but its upper line is markedly hump-backed, there being a pronounced convex bulge from the rear of the cowling to the base of the windscreen and another from the top of the cockpit cover to the "after-deck" of the fuselage. This places the pilot rather high, and gives him excellent visibility, but at the cost of a certain amount of drag, as indicated by a maximum speed of less than 300 m.p.h.

The tailplane is elliptical and the fin and rudder form an inverted "U" with a more pronounced slope to the leading-edge. Twin machine guns project from the forward convexity of the fuselage, their muzzles lying in troughs in the top of the engine-cowling.

Types previously compared: (1) Hurricane and Me 109; (2) Spitfire and He 113; (3) Beaufort and Ju 88; (4) Lysander and Hs 126; (5) Hudson and Me 110; (6) Anson and Fw 187; (7) Hereford and Do 215; (8) Blenheim IV and He 111K; (9) Skua and Ju 87B; (10) Swordfish and Ar 95; (11) Sunderland and Do 26; (12) Gladiator and Cr 42; (13) Bombay and Ju 86K.

Next week: Wellington and Fiat Br. 20.

BUILDING A SPITFIRE

Large-scale Production at a Huge "Shadow" Factory for the Battles of 1941

(Illustrated by "Flight" photographs)

THE record of the fighting Spitfires in the skies above Britain is a proud one, and in the years to come its name will still be conjured with by generations yet unborn. Because of its connection with the repulse of the *Luftwaffe* in the Battle of Britain in 1940, the name "Spitfire" will probably achieve an honoured place in English literature of the future. Product of the able designers of the Vickers-Supermarine Company, it is being flown in this war by fearless pilots who have brought to life what is, in the last analysis, but a mechanism. And in bringing it to life, they brought death to many of their German opponents in their Messerschmitts, Heinkels, Dorniers and Junkers. Our pilots brought the Spitfire to life, and in their hands it drew long white sky trails in the blue, seeking the enemy, and then for a few brief seconds poured a hail of lead from its eight guns to send an adversary spiralling down to earth. . . . But all cannot have victory after victory, and there were those who paid the price.

Much of its success was due to the Air Ministry's decision, made long before the war, to arm it with eight guns, and if it had not been so well armed it could not have won, wing-tip to wing-tip with its brother Hurricane, that furious encounter which was continued over August, September and October of last year. For they fought against odds, long numerical odds. But they won.

Shelters and Blast Walls

Last year's deficiency in numbers is now being made good, for the results of plans for the production of aircraft made before the war by the Government and the aircraft and motor car industries are now becoming fully apparent in the output from the "shadow" factories. A visit to one of these factories making Spitfires of the Mark II variety, a version which has a later model of engine, showed that very great efforts are being made to produce a fighter force which shall be adequate in numbers as well as possess technical supremacy.

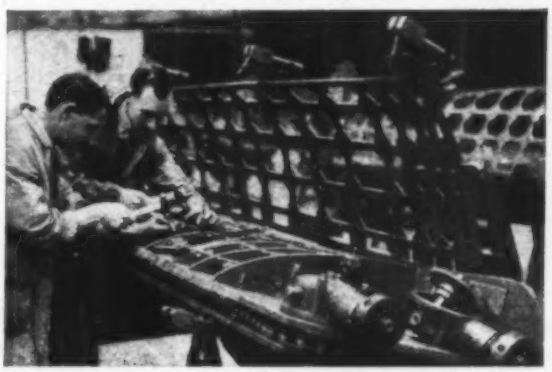
In great roomy factories arranged in blocks, men and women work under the mercury vapour lights at row on row of machine tools—lathes, milling machines and drills, each with its independent electric drive. Many of them are war trainees, new to such factory work since the war. About three weeks' training is required to enable a girl to run a capstan lathe properly, but for the more skilled manual work, such as riveting light alloy sheet, two months' training is given. The high roof and the absence of overcrowding make the factory appear much quieter than many others.

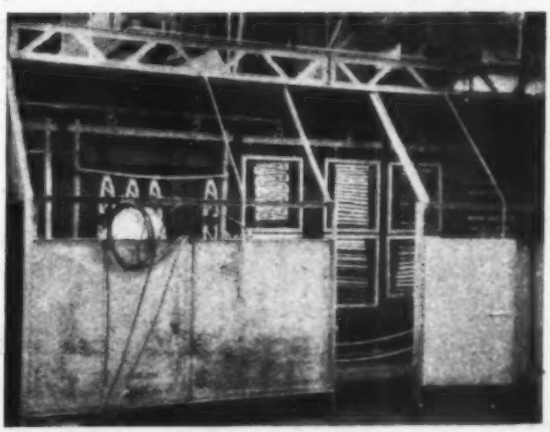
As one walks through the material stores one sees quantities of sheet metal stored in racks and tubing stacked vertically. Power saws cut off the required lengths of bar material and these are taken away to the machine shop on trolleys drawn by petrol engines and driven by girls. Everything is scrupulously clean.

The finest air-raid shelters seen have been provided in these works. Of the same shape as the familiar brick

Girl war trainees are capable of working capstan lathes efficiently after a training period of about three weeks.

This Berliner stretch-press is used for forming curved sheet metal parts very quickly by pressing a steel-covered wood die upward into the curve of the sheet held by its two ends. Note the blast wall of brick built round the machine



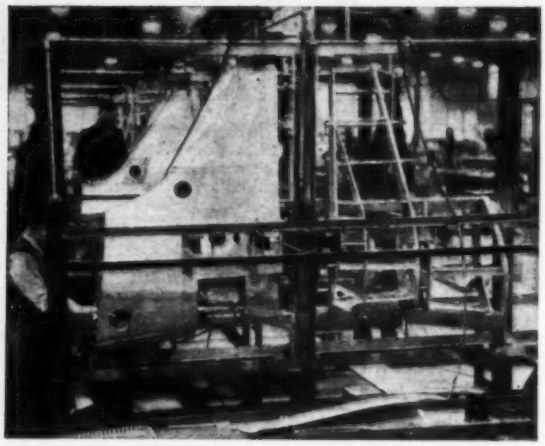


(Right, above) **This elaborate jig is for drilling the metal skin of the leading edge of the wing. The curved sheet, formed to shape on the stretch-press, is placed in the jig and the upper part hinged down. The holes in it guide the drills.**

(Right) **The long chain conveyor, carrying details to be painted, passes through one of the spray booths in which the details receive their first coat on one side.**

BUILDING A SPITFIRE (Continued)

The fitting of this De Havilland constant-speed airscrew is one of the last operations in final assembly.



The stern section, complete with fin, is built in paired jigs. Air lines for hand tools come down from overhead reels on which they are wound.

Girls cover the petrol tanks with layers of self-sealing rubber and an outer layer of canvas so that bullets can hole the tank without loss of fuel.

surface shelter, they are built entirely of reinforced concrete, both walls and roof, and so would present a monolithic structure to the destructive effect of blast.

Even some of the machines, the more important ones, are protected against bombing by blast walls of brick built up as high as the machine itself, and so close to it that just sufficient working space is left round it. The Pratt and Whitney jig borer and the Berliner stretch-press are two of the machines so protected. All the jigs in which the various parts of the Spitfire are built must be drilled on the jig borer, which is, of course, designed for extremely accurate work.

Stretch-pressing and Spot Welding

The stretch-press is also an interesting machine, and a type rarely seen in this country. Built by the Berliner Company of America, it is a development of the German Schuler press. As can be seen in our photograph, it works by forcing a shaped die upward into a bent-over sheet of light alloy which is held by its two sides. The sheet metal is thus acted on by a violent tensile force which stretches it so that it takes up the shape of the steel-covered wood die pressed into it. The tremendous reduction of labour which such a machine can accomplish will be realised when it is pointed out that not only parts of the engine cowling can be made on it, but even whole sections of the wing skin as large as 14ft. long and 3ft. wide. What would take days to do by the hand method sometimes known as "tin bashing" is done by this machine in a few minutes, and with the certainty that all parts are exactly the same shape. Sheet-metal details are made in pairs out of one sheet so that the pressing is a symmetrical one; after completion it is then cut down the centre into the two parts.

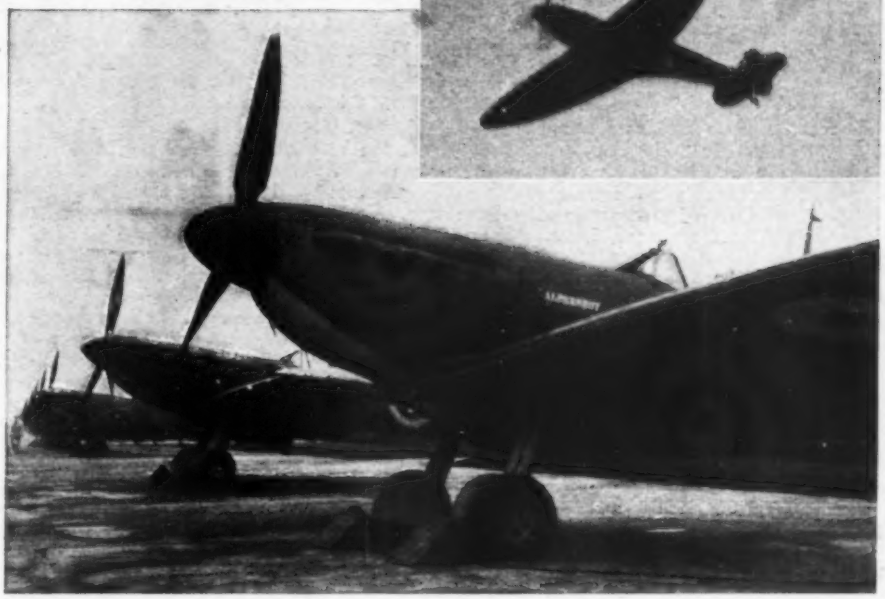
A Sciaky spot-welding machine next attracts attention. When applied to work for which it is suitable, this machine can turn out very quickly parts welded together out of steel or aluminium alloy sheet. The part to be welded is placed in the jaws of the machine, the operator presses a foot switch, and the two copper electrodes come together and allow the passage of a powerful alternating current arc followed by a direct current which melts the two metals and joins them together.

A piece of equipment indicative of the great efforts which have been made to ensure speedy production is the chain

BUILDING A SPITFIRE (Continued)

conveyor for paint spraying. In continuous slow movement, this conveyor has suspended from it groups of wired-together parts which are ready for painting. They pass through one booth in which they are sprayed on one side, and then to the next for the reverse side. After passage through a drying oven, the conveyor takes the parts to two more spray booths for their second coat. The whole apparatus is most impressive in its efficiency and size, and it occupies a length of shop of about 400ft.

In the sub-assembly shop one sees whole "streets" of jigs for the construction of wings, stern sections (which



"Come and get them." Spitfires lined up on the tarmac waiting to be ferried away by Air Transport Auxiliary (Inset) Off to a fighter squadron

(Left) The factory test pilot, just before taking a Spitfire up to show what can be done with it.

are built in one piece with the fin), and fuselages. And at each one operatives are busy with drill and riveting gun. All such hand tools are air driven, the rubber air line very conveniently coming down from a reel mounted on the top of the jig. All surplus air line can be reeled up out of the way with the same action as one uses in rolling up a blind, a most convenient method.

Assembly and Flight Testing

Then in the final assembly shop the fighters take shape. Wings, fuselage and undercarriage are assembled into an airframe, and the Rolls-Royce Merlin XII is lowered by mobile crane into the engine mounting and coupled up with all its controls and piping. One of the last procedures is the fitting of the constant-speed airscrew, and then the Spitfire is ready to leave the factory and be towed by tractor to the flight shed.

Here it is fuelled and then "swung" for compass adjustment on the swinging base. After that it passes into the hands of the test pilot for the first time and is given a short flight. This may only last for perhaps five minutes, for as soon as any minor matter requiring adjustment is found, the machine is landed and the adjustment made at a travelling "caravan" which stands out on the aerodrome. The adjustment made, the test pilot again takes it up to seek for more faults. Anything greater than a minor fault necessitates that the machine go into the flight shed for the work to be done. When everything has been properly adjusted, a full-throttle climb is made, and such things as engine temperatures are recorded. Then follows a dive at an indicated air speed of 470 m.p.h. The actual speed is, of course, considerably greater than this, since the dive may be done at an altitude of 18,000ft. At this altitude 470 m.p.h. indicated is equal to 622 m.p.h. true. The purpose of the dive is to test structural strength and the feel of the controls. "Though all Spitfires are good to fly," the test pilot remarked, "there is that one in fifty which has everything just right, and which you feel is an absolute thoroughbred."

He then proceeded to give an exhibition of real flying, although a dirty fog had shut down and there was not the slightest horizon to aid him in the execution of the three beautiful slow rolls which he did at extremely low altitude. And as the carburettor engine "cut out," which from its nature it must do, for the brief couple of seconds when the aeroplane was on its back, there were hearts which "cut out" for a couple of beats. But they "cut in" again as inevitably as the engine did each time. The pilot's remarks on the loading which the human body could stand in aerobatics were interesting. If flying in the ordinary relaxed condition, he gave $2\frac{1}{2}$ to $3g$ as the maximum; if with muscles tightened, $3\frac{1}{2}$ to $4\frac{1}{2}g$; while it all possible resolution and bad language are brought into play and a real attempt made to pull the wings off, $7g$ may be withstood.

After testing, the Spitfire goes to the flight shed for installation of non-flying equipment and the final A.I.D. inspection. It is then "dispersed" around the aerodrome in case of bombing, and as the aircraft accumulate the Air Transport Auxiliary is wired a request to collect and ferry them away. Such is, very briefly, the sequence of processes through which a Spitfire goes before it passes from the "shadow" factory into the hands of the pilots of the Fighter Command, there to play its part in the battle of the democratic against the totalitarian states.

Air Strategy—XLVIII

COMBINED OPERATIONS

Is There Such a Thing as Air Strategy?

By CAPTAIN NORMAN MACMILLAN, M.C., A.F.C.

THROUGHOUT the not inconsiderable duration of British history there has been a pronounced digestive quality. In our time we have digested Celts (some of them have proved pretty tough), Romans, Danes, Norsemen, Angles, Normans, Saxons; and many others by marriage and the processes of naturalisation. Authors have written about the ability of the British peerage to swallow rivals who have grown strong in wealth or political prestige; this is simply another example of the strength of the British digestive tract. The same primary urge of life is not less observable among individuals and institutions who, having acquired precedence, desire to retain it. And who shall blame them? This system encourages the mixture of blood which adds strength to nations; it encourages a combative spirit among individuals and institutions which keeps them at fighting tension even in times of peace, and this may in part explain why the British change from a nation unarmed to a nation in arms more rapidly, and when the need arises, with less equivocation, than any other people. No German can understand! After all, why should he? His system of worship is the antithesis of ours. Our version of "Heil Hitler" is "Whatcher, Bill."

This British quality of ingurgitation has been observable for a long time in relation to the air service. The two older Services have given every indication of a hungry desire to swallow their youngest brother, if only such obvious cannibalism were not frowned upon from on high. But already they have got their teeth into some of the limbs; the secret rites of combined operations shroud the feast from the eyes of the uninitiated. Combined operations are, of course, as necessary to the satisfaction of modern tactics in war as is a full set of cutlery to satisfaction in the enjoyment of a banquet; in each case the maximum requirements in the technique of fighting and of eating are provided. But there the similarity ends, for the order of a banquet is determined by custom, whereas the order of a war is a matter seldom, if ever, repeated.

Away with Seniority

The order of precedence of the three Services is all right as a matter of parade-ground principle in peacetime, but it ought never to be permitted to function in war. When the Services are stripped for action, seniority in regard to command ought to be determined by the circumstances of the moment and of the place, and by no other criterion. Perhaps that is the real meaning of the combined operation. I shall believe it when we see the air in command of some such operation. So far, in this war, we have seen the sea in command, and the land in command; but always the air has been conjoined with one of the older Services.

It may be argued that this precedence in command has been prescribed by the circumstances of the war to date. But I know of no official pronouncement which can be brought to light to substantiate such an argument. On the other hand, there has just appeared in a Service journal an editorial footnote which seems to me to be a pointer in an opposite direction. This footnote says that, as air forces are essentially employed against land or sea objectives, it has always been questionable whether the term "air strategy" in its literal sense has any real meaning.

To me that is an astonishing thing to find in a Service journal in the year 1941. It might have been less surprising to discover it in such pages in 1939 if it had been written prior to the month of September. But in 1941! Surely it is now a matter of history that the Battle of Britain, 1940, was won by the strategic air-defence system of the Fighter Command, operating its air forces essentially against air objectives in the shape of the bombers and fighters of the *Luftwaffe*, in a victory which may be counted in years to come as the turning point of the second Anglo-German war. The Germans lost that battle because they failed to appreciate the requirements of air strategy.

Previously the Fighter Command had gone into action over Dunkirk. There, too, their action was directed solely against air objectives even though their object was to defend, from air attack, ground forces who were unable to defend themselves from such attack.

These are two cases where British defensive air forces were essentially employed not against land or sea objectives, but very specifically against air objectives. It may be said that here I am arguing from the general to the particular, and that such cases as I have mentioned are rare, but what would have been the position of the British people without them?

Against Air Objectives

It must be conceded, therefore, that in some circumstances there is air strategy *qua* air strategy, when aircraft are directed not against land or sea objectives but against air objectives, so that their action cannot be classified under the headings of sea or land strategy.

The generalisation remains, however, that, apart from these rare "exceptions," air strategy must be concerned with terrestrial objectives and is, therefore, not air strategy at all, but simply the employment of aircraft in sea or land strategy. It seems to me that this generalisation is as dangerous as are most generalisations, that any argument built upon it may be a false premise and that we shall not win the war as swiftly as we might if we permit ourselves to adopt this outlook upon air operations. Because, if we do adopt this outlook, we say to ourselves that air weapons are no more than auxiliaries to sea and land weapons, and, if we concede that, we might as well pack up our air force straight away and hand its squadrons over to the Navy and the Army without further ado, for do we not possess a separate Ministry of Aircraft Production which can be relied upon to see to output of aircraft without a separate Air Ministry? And I dare say there may be people on both sides of Whitehall who would not be sorry to see such a policy established.

Value of a Separate Air Force

Now, at the risk of repetition, I am going to ask point blank how we would have fared during the Battle of Britain if there had not been a separate Air Force with a unique Fighter Command? It is hardly conceivable that a command of this nature would have been established under a dual airarchy. It was a command which could have been evolved only under the system made possible by the possession of a separate air force. Again, if the Air Force had been the divided child of the Navy and Army at the outbreak of war, is it to be supposed that the number of squadrons which were retained in the United Kingdom would have been kept there? Is it not almost certain that many more fighter squadrons would have been abroad at the crucial moment of Dunkirk and that it would have been difficult, if not impossible, to get them back to the United Kingdom and organised as were the R.A.F. squadrons for the Battle of Dunkirk and the first Battle of Britain?

Now, what precisely is strategy? On the answer to that question much depends. Presumably the Service journal I have referred to considers that strategy bears a direct relationship to the objective and must be classified accordingly. If that were really so, there is a good case for advancing the Air Force to the position of the Senior Service, for it is the one arm which can attack objectives on land, on the surface of the sea, under the sea and in the air. Accordingly, the sea and land forces ought to be made subservient to the requirements of this universal force.

COMBINED OPERATIONS (Continued)

but, personally, I reject the idea that the objective defines the classification of strategy to-day.

To put it as simply as possible, strategy can be defined as the art of the application of power. The power can be of any nature save horse-power; it can be financial and diplomatic as well as naval, air or military power. Hitler's strategy, both before September, 1939, and after that date, included the employment of financial and diplomatic power as well as the power of his fighting services. The measure of his success after he became Chancellor of Germany in 1933 was to a great extent conditioned by the absence of trained strategists in the positions of leadership in Britain and France. MacDonald, Boldwin, Neville Chamberlain were none of them strategists in the sense that Hitler was a strategist. The accession of our present Prime Minister to office at one of the blackest hours in British history brought into strategic conflict with Hitler for the first time a leader whose whole life might almost have been lived so that he was fitted for the call which came to him in 1940. No wonder the Nazis hate and fear our Prime Minister.

Training of a Leader

Winston Churchill was trained as a soldier; he served in six campaigns as a junior officer, a war correspondent and a battalion commander. He is the only Minister of the Crown who has been at the head of each of the three Service departments, and, in addition, he has been at the head of the Exchequer and the Home Office. Moreover, during the MacDonald-Baldwin period of puerility in politics he was in opposition long enough to sharpen an adroit brain to razor-edge. If anyone, knowing decades in advance how Britain was to be faced in 1940, had started out to train himself intentionally to be fitted to lead the British people in the time of their greatest need, he could not have purposely planned a better course of training than that which fell to the lot of the eldest son of the third son of the Seventh Duke of Marlborough.

There is no need to recount how, since the black hours of Dunkirk, the pendulum has moved slowly (as it does at the reversal of its motion) but progressively in the opposite direction. It is a matter of common knowledge that Hitler's hitherto unbroken list of strategic successes has not continued. That can be no mere trick of chance. Hitler, the strategist, has, for the first time in his career as leader of the German people, found himself opposed by a master strategist.

More than in any great-scale war in history, this war is a war waged between two men; the capitulation of France made it so. Perhaps that is why France had to fall, for we could not afford the rival (and sometimes jealous) strategists of the 1914-1918 war to-day: war moves too fast now for that.

This, then, enables me to define my conception of the meaning of strategy in totalitarian war to which Britain is to-day committed. Because strategy must be handled on a totalitarian scale it soars far beyond the confines of the strategy of former wars in which the general or the admiral was the master strategist. To-day the general or the admiral exercises authority over local strategy only; in other words, he has authority over the strategic employment of the forces at his disposal within the area over which command has been placed in his hands. He is but a part of the master strategic plan whose control is vested in the hands of one man, or of a group of men, who are ordinarily far from the field of battle and in whom the whole power of the nation at war is reposed.

It has been demonstrated over and over again during the course of the present war (and it was indicated clearly during the 1914-1918 war) that air superiority is a condition necessary to success in a theatre of war. Failure to obtain air superiority spelled the failure of the Germans in the first Battle of Britain as surely as its possession spelled their success in Norway. The securing of air superiority by the R.A.F. in the Western Desert was the prelude to the defeat of the Italians at Cyrenaica, and to their defeat in other parts of north-east Africa. Does, then, the gaining of air superiority over the enemy count for nothing in strategy? Is not this seizing of superiority in the air obtained through air operations directed against the air forces of the enemy? If it is not so gained, how is it gained? How are air operations against the air forces of an enemy to be regarded if not from the aspect of air strategy? They may, it is true, be part of a larger plan, just as the succeeding, or collateral, army or naval operations form part of a larger plan. But to dismiss the part played by the air forces in such an operation as no more than a section of land or sea strategy is to relegate the air arm to the old familiar position of the extra shot in the locker of the older Services which it occupied prior to 1918 and from which it had to be levered by the energy and courage of Mr. Lloyd George against considerable opposition.

Pooling of Strategy

The combined operation is something more than the temporary unification of the three Services. It is the pooling of sea, land and air strategy. The commander should be chosen for his special qualities or because his Service is for the time being the one upon which the brunt of the work will fall. (Here it may be noted that a German air force general was in command of the forces detailed for the invasion of Denmark.)

Some of the raids of the Royal Air Force Bomber Command over German and German-occupied territory are certainly made subservient to the needs of British naval strategy, but they are not all subservient; some of them bear to the war as a whole a relationship which is in effect the same as that of the British naval blockade. Are these strategic raids upon far inland cities of Germany to be called a part of the naval blockade? If not, what else can they be but the sequences of a long-term air strategy designed to weaken by destroying where the Navy seeks to weaken by withholding? The truth is that air blockade is a very real factor in modern war; it is being applied in this war for the first time, and it may well be that it will have a more hastening (and chastening) effect upon the course of the war (and the Germans) than the blockade by sea.

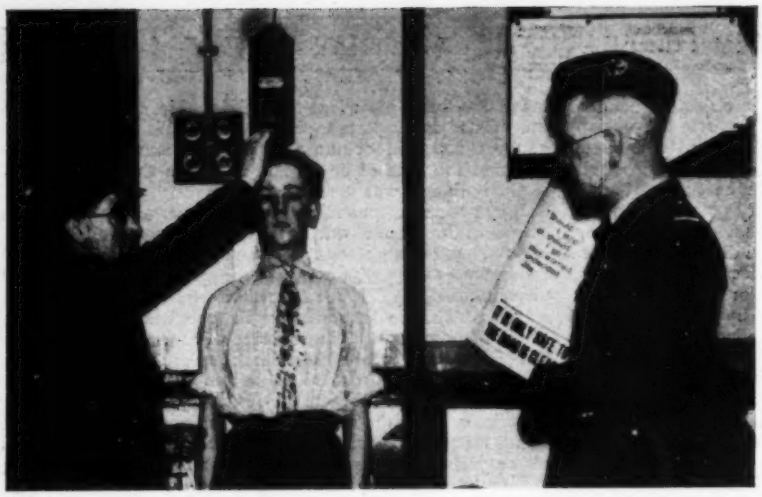
It is wrong to dismiss air strategy as a myth. It is a grave reality. It is our fault as a nation that we did not appreciate the full implications of air strategy and so failed to build in time an air force powerful enough to deal with those implications. It was that as much as anything which made the present war inevitable.

Aircraft Production

SOME very interesting articles appear in the April issue of our associated journal *Aircraft Production*. The merits of the petrol injection pump as against the carburettor are discussed in two articles, one describing the Hispano-Suiza wind tunnel and the other reviewing a report based upon bench tests of a Rolls-Royce Merlin engine, and two Junkers Jumo 211D engines removed from a Heinkel 111 aircraft. "Control of Planned Production" is the title of another article outlining the production system in operation at the Rootes airframe factory, while the final instalment of a treatise on the "Welding of Airframes" describes directional welding and incorporates advice to the draughtsman. Stressed-skin metal-wing production on the Hawker "Hurricane," tube grinding and polishing, and "Surface Finish," including honing and the use of the profilometer, are other features.

The monthly reviews of shop equipment and small tools and modern machine tools, regular features of *Aircraft Production*, appear, together with notes and notices of the aircraft manufacturing industry, and not least in importance, an informative abstract from a paper on the utilisation and training of female and semi-skilled operatives, presented to the Institution of Production Engineers by its chief inspector of Munitions Labour Supply, Mr. B. C. Jenkins, M.I.P.E. The issue is now on sale, price 1s. 6d.

HERE AND THERE



POTENTIAL PILOT. Although the Air Training Corps was launched only in February, the youth of this country has responded so magnificently that already some 1,200 squadrons have been formed. Here we see Adjutant H. Baker running the rule over a promising recruit at Manchester. On the right is Cadet F/O. H. Blake, Officer commanding No. 430 Squadron, Manchester and Salford A.T.C.

Sir Cecil Weir's New Post

A SHORT time ago it was announced that the Government had decided to set up a central control of factory and storage premises through which the requirements of all Government departments would be co-ordinated.

The President of the Board of Trade has now appointed Sir Cecil Weir, K.B.E., M.C., to be Controller-General of Factory and Storage Premises. Sir Cecil, who is a member of the Industrial and Export Council, will take up his duties shortly.

Desirable Residence

HUTS are now being made, at certain R.A.F. stations, from the huge packing-cases in which the smaller American aircraft are shipped to this country. This holds out possibilities for some delightful house names over the doorways of these desirable residences.

What about Martlett Mansions, Caribou Cottage, Grumman Grange, and Vultee Villa?—or even, at a pinch, Bell-a-vista?

Causes of Structural Failure

SEVERAL illuminating facts emerge from the summary of reports on structural failures and defects in airframes prepared by the Civil Aeronautics Administration and published in the February 1 issue of the U.S. Department of Commerce's *Civil Aeronautics Journal*.

These reports cover the period from January 1, 1935, to October 25, 1940, and have been compiled by the Aircraft Airworthiness Section.

Particularly significant is the statement that of the number of structural failures traceable to "well-defined contributing causes," no fewer than 65.24 per cent. were due to inadequate maintenance, 22.30 per cent. to faulty factory workmanship, 8.44 per cent. to faulty repairs, 1.56 per cent. to flutter, and 2.46 per cent. to aerobatics.

The total number of cases investigated was 1,655, of which as many as 791 occurred to landing-gear, 284 to wings, 206 to the fuselage, and 191 to the control systems.

By far the greatest number of fatal accidents were caused by failures in wings and control systems ascribable to inadequate maintenance, which points an all-too-obvious moral.

Black Light

ELECTRONIC LABORATORIES, INC., of Indianapolis, are making electric lamps which give off no visible light but emanate a near ultra-violet radiation which causes fluorescent paint to glow. This development is being applied to improve the lighting of instrument boards, all the markings of the instruments being made with the fluorescent paint. "Black light" has become the popular name of the lamp's emanation, and the system should eliminate dazzle and eye-strain.

Keen Youngsters

ACCORDING to the April issue of *A.T.C. Gazette* (the bright little monthly journal of the Air Training Corps) there are so many boys of under 16 who are clamouring to join the A.T.C. that the Boy Scouts Association has come to the rescue by starting a new branch to cater for these keen youngsters who are too impatient to wait until they are old enough to join the A.T.C.

So now we have Air Scouts for whom four new badges have been introduced—Air Apprentice, Air Navigator, Air Mechanic and Air Spotter. The next thing you know the toddlers will be up in arms at being left out, so don't be surprised if it's Air Cubs, too, before very long!

Trans-Canada Mail Rates

A REDUCTION to 40 cents per aeroplane-mile for mail carried by Trans-Canada Airlines was announced recently. The contract for the current year between the Post Office Department and the airline had not been concluded on March 1. Under the existing arrangement between postal authorities and Trans-Canada Airlines mail is carried at a rate of 60 cents per aeroplane-mile, which rate covers any mail load up to 1,200 lb. This amount is reduced to 1,000 lb. in crossing the Rocky Mountains. Determination of the rate to be paid by the Post Office Department to the air mail carriers is reached by determining the difference between operating cost and operating revenue of the airline. It was hoped that by the end of 1940 it would be possible to get finality as to rate arrangements, the year just closed having been regarded as the experimental period, but now that it has been decided to considerably increase the mileage of air mail carriage the postal authorities are not yet in a position to decide finally on all the conditions of the new contract.

Australian Instrument Manufacture

ONE more step towards national self-sufficiency in regard to aircraft has been taken in Australia with the manufacture of instruments by Amalgamated Wireless. This company has undertaken the production of altimeters, air speed indicators, compasses and pressure gauges as well as gyroscopic instruments. Other instruments may also be produced later.

Spotting by Ear

A SOUND detector for use by roof-spotters is reported in the March 14th issue of *The Engineer* to be in use at an electrical engineering works. This device consists of a parabolic reflector with a sensitive microphone at the focal point. A four-valve amplifier is connected to the "mike" with one or more pairs of earphones as required. By swivelling the reflector until the sound of a far-off plane is at its maximum volume the spotter can get its direction even when poor visibility prevents his seeing it at a distance, and by careful listening he can tell if it is approaching his post or not.

A number of unnecessary "take cover" signals have been eliminated by the use of this simple instrument, it is claimed, and much valuable time saved in consequence.

Whose Move?

RECENT reports of more "invasion manœuvres" by German troops and a reminder from Gen. Sir Alan Brooke that Hitler is known to have been taking a lively interest in gliders have served to revive public speculation on the chances, nature and probable date of the long-anticipated Nazi attempt to set foot upon these shores—as other than prisoners!

And now, in the 1940 edition of *Jane's All the World's Aircraft*, one of its co-editors, Mr. C. G. Grey, says that the outlook for next year is excellent and that "we shall have new fighters and bombers in quantities which will, in due course, give us such command of enemy coasts as will give our Navy and Army power to land and carry the war into enemy country."

So the question seems to be, "who will move first?"

Service Aviation

Royal Air Force and Fleet Air Arm News and Announcements

Atlantic Arrivals

IT has been known for some while that deliveries of aircraft by air were being made across the Atlantic. The Ministry of Aircraft Production has now issued an official intimation that the four-engined Consolidated Liberators are also arriving in this manner.

Peregrine Falcons

THE order which makes legal the destruction of peregrine falcons, and the taking of their eggs, is extended to cover the counties of Cumberland and Westmorland.

Severe losses to homing pigeons of the R.A.F. and Army have been caused by these falcons, which, in normal times, are protected birds. The order applies only to authorised persons and is not general.

Praise for W.A.A.F.

THE Women's Auxiliary Air Force came in for a special tribute from the Duchess of Gloucester in a recent broadcast when she remarked that, after the war, when victory was ours and the whole story could be told, the world would be amazed to learn what immensely important work the W.A.A.F. had been doing in helping us to attain our end.

"We all know with what calm courage the airwomen have faced their share of concentrated attack from the air," said the Duchess, who also praised the work of the kitchen and domestic staffs.

Farm News

RIVALRY is developing between R.A.F. stations as to which can grow the most food. The success of some Fighter Command stations with pigs, poultry and spring cabbages has already become famous. Bomber pilots have now gone back to the land. At one station it was decided to acquire sheep instead of other live stock. The flock has been installed in wire enclosures round some of the defence works.

It seems all wrong to us. Surely the Bomber Stations should devote their time to egg-laying, and Fighter Stations to rounding up sheep?

SOCIAL CALL. Here is the Duke of Kent having an informal chat with two R.A.F. mechanics. His Royal Highness visited two famous fighter squadrons recently, one a Polish and the other a City of London squadron, when this picture was taken.

Awards

THE King has been graciously pleased to approve the following appointment in recognition of gallantry displayed in flying operations against the enemy:—

DISTINGUISHED SERVICE ORDER.

Lt. R. H. KERSHAW—No. 3 Squadron, South African Air Force.

In March, 1941, this officer was pilot of one of a flight of Hurricanes engaged in an attack on the aerodrome at Diredawa. During the engagement his Flight Commander was compelled to make a forced landing on an enemy satellite aerodrome. Lieutenant Kershaw immediately went to his assistance, landed his aircraft on the aerodrome, under heavy artillery fire, and picked up his Flight Commander, who flew the aircraft back to base while sitting on Lt. Kershaw's knees. By his promptitude and determination this officer saved his Commander and displayed the greatest courage and devotion to duty.

Sq. Ldr. P. B. B. OGILVIE.—In March, 1941, this officer undertook an important daylight reconnaissance and obtained the most valuable results. In the execution of this task, Squadron Leader Ogilvie displayed exceptional navigational skill throughout the flight of over 1,100 miles. As commanding officer of the unit, Squadron Leader Ogilvie has set a splendid example both in the air and on the ground, and his courage and determined leadership have been outstanding. He has completed fifteen daylight reconnaissances, often under difficult conditions, obtaining excellent results on many occasions

THE KING has been graciously pleased to approve the following awards in recognition of gallantry and devotion to duty in the execution of air operations:—

BAR TO THE DISTINGUISHED FLYING CROSS.

Flying Officer Charles Harold DYSON, D.F.C.—No. 53 Squadron.

DISTINGUISHED FLYING CROSS.

Wing Commander C. RYLEY.—No. 53 Squadron.
Wing Commander Richard Alfonso SPRAGUE.—No. 208 Squadron.
Squadron Leader Alan Duncan MURRAY.—No. 73 Squadron.
Act. Flight Lieutenant Peter William de Bordenave FORSYTH.—No. 148 Squadron.
Act. Flight Lieutenant Edric Hartgill MCHARDY.—No. 248 Squadron.
Captain Daniel Albertus DU TOIT (South African Air Force).—No. 12 Squadron.
Captain Peter Johannes ROBERTS (South African Air Force).—No. 11 Squadron.
Flying Officer James Robert HYDE.
Flying Officer Derek SHAWE.—No. 254 Squadron.
Pilot Officer William VALE.—No. 80 Squadron.

DISTINGUISHED FLYING MEDAL.

565558 Flight Sergeant Donald Swift GREGORY.—No. 80 Squadron.
517815 Sergeant Ernest Claude BENNETT.—No. 55 Squadron.
506659 Sergeant Gerald William HORTON.—No. 113 Squadron.
566286 Sergeant K. R. PRICE.—No. 113 Squadron.
564395 Sergeant E. ROBERTS.—No. 112 Squadron.
563933 Sergeant Eric Franklin THORNICROFT.—No. 113 Squadron.
623275 Sergeant Alan WEST.—No. 22 Squadron.
517003 Sergeant A. F. WILES.—No. 55 Squadron.

One of the recipients of the above awards was captain of one of three aircraft detailed to rove the Heligoland Bight. He lost touch with the other aircraft in bad weather and set course for Den Helder, in Holland, alone, where he attacked two armed ships. He then attacked a seaplane base. On the way home, by skilful manœuvring, he beat off an attack by a Messerschmitt 110.

Another recipient, when deep in enemy country over Sogne Fjord, Norway, bombed and disabled a merchant vessel.

One officer destroyed five enemy aircraft in one day. Later, when the enemy was employing large masses of aircraft, he encountered six fighters and shot them all down. Another officer drove off an enemy fighter which had severely damaged his own aircraft while he was machine gunning Castel Benito aerodrome, Libya. He has twice damaged and set on fire enemy aircraft at this aerodrome.

One of the sergeants was pilot of one of nine Gladiators which engaged 54 enemy aircraft. He personally shot down two. He has destroyed altogether six enemy aircraft. Another sergeant has become a specialist in long-distance strategical reconnaissance. He obtained information regarding the enemy's intention to abandon the Benghazi area, which was of great assistance to the G.O.C. Western Desert.

JUST WHAT THE DOCTOR ORDERED. At this Royal Air Force depot the Women's Auxiliary Air Force have their own hospital, complete with a W.A.A.F. dispenser, so "medicine and duty" has its compensations.

THE KING has been graciously pleased to approve the following awards:—

AIR FORCE CROSS.

Wing Commander Reginald Bryson WARDMAN.
Act. Wing Commander F. S. HOMERSHAM, D.C.M., M.M.
Act. Wing Commander Peter Rodriquez MAY.
Act. Wing Commander G. C. O'DONNELL, D.F.C.
Squadron Leader Cyril Carlile HODDER.
Squadron Leader Richard John C. NEDWILL.
Squadron Leader Mervyn Hugh RHYS.
Squadron Leader H. de Clifford A. WOODHOUSE.
Act. Squadron Leader D. G. ALLISON, R.A.F.O.
Act. Squadron Leader Douglas Henry V. CRAIG.
Act. Squadron Leader Royd M. FENWICK-WILSON.
Act. Squadron Leader William Ernest HOOPER.
Flight Lieutenant John Aiden FIELD.
Flight Lieutenant Morgan GRIFFITHS.
Flight Lieutenant Peter Warren JOHNSON.
Flight Lieutenant R. H. MCINTOSH, R.A.F.O.
Flight Lieutenant Wilfred MILLER, R.A.F.O.
Flight Lieutenant Vivian Reginald MOON.
Flight Lieutenant Derek Sydney PAIN.
Flight Lieutenant Keith Norman SAYERS.
Flight Lieutenant Donald L. TOWNSEND, R.A.F.O.
Flight Lieutenant I. E. C. WATSON, R.A.F.V.R.
Flying Officer Richard George BURKS, R.A.F.O.
Flying Officer Philip Henry KNOWLES.
Flying Officer John Cyril Mason WILSON, R.A.F.O.
Act. Flying Officer Hugh Philip HOPKINS.
Act. Flying Officer Eric Bertram G. MASEFIELD.
Act. Flying Officer William John RYE.
Act. Flying Officer James Sibley SIMONS.
Warrant Officer William Henry FORSTER.

AIR FORCE MEDAL.

Flight Sergeant Thomas Alfryn HOWELLS.
Flight Sergeant Leslie Harry POLTOCK.
Flight Sergeant Cecil Joseph ROSE.
Sergeant Sidney Harry PARKER.

THE KING has been graciously pleased to approve the award of the British Empire Medal to the following airmen:—

Sgt. D. R. YOUNG.
A/C.1 C. E. TAYLOR.
A/C.2 A. L. H. HIGGS.

One night in January, 1941, a Wellington aircraft crashed near an aerodrome. The aircraft became enveloped in flames, but, despite exploding incendiaries and small arms ammunition and the possibility that bombs in the aircraft might also explode, these airmen attempted to extricate the rear gunner from his turret, which had become jammed. Being unable to break open the turret, A/C. Taylor endeavoured to enter the fuselage, but was beaten back, being slightly burned in the effort. Axes were then obtained and Sgt. Young, assisted by the two airmen, smashed the rear gun turret and succeeded in rescuing the gunner. These airmen showed courage and resolution throughout.

London Gazette

Royal Air Force

Air Ministry, March 28th, 1941.

General Duties Branch.

Air Commdre. C. E. H. Medhurst, O.B.E., M.C., is apptd. Assist. Chief of the Air Staff (Intelligence) and is granted act. rank of Air Vice-Marshal (Mar. 1).

The follg. are granted commns. for duration of hostilities as P/Os. on probn.:—Flt. Sgt.: (Feb. 28) H. W. Edwards. Sgt.: (Jan. 31) R. H. Francis, D.F.M.; (Feb. 27) R. S. Williams; (Mar. 3) G. A. Steward, D.F.M.; (Mar. 9) T. P. Pratt. Temp. Sgt.: (Feb. 26) J. G. Cansdale

SERVICE AVIATION (Continued)

P/O. on probn. A. H. Draper is confirmed in his appt. and promoted to war substve. rank of F/O. (Jan. 17).

P/O. on probn. W. P. Olesen is confirmed in his appt. (June 26, 1940) and promoted to war substve. rank of F/O. (Feb. 28).

The follg. P/Os. on probn. are confirmed in their appts. (July 10, 1940) and promoted to war substve. rank of F/O. (Mar. 24):—B. T. J. Newland, J. P. Quirke.

The follg. promotions are made with effect from Mar. 1:—Sqn. Ldr. to be Wing Cdr. (temp.): C. M. Windsor. Flt. Lts. to be Sqn. Ldrs. (temp.): C. F. Darbishire, D. A. Kerr.

The follg. F/Os. are promoted to war substve. rank of Flt. Lt.:—(Dec. 5, 1940) F. C. Phillips (Ret.); (Dec. 6, 1940) A. E. Bull; (Jan. 17) P. E. Lewis; (Jan. 24) J. R. H. Lewis; (Jan 30) P. H. Cribb, G. W. Petre, E. O. Porter, B. P. Young; (Feb. 10) G. R. Taylor, D.F.C.; (Feb. 12) L. C. Deane; (Mar. 23) L. H. Trent, D.F.C.; (Mar. 27) C. P. Barber.

F/O. A. J. Carver is granted war substve. rank of Flt. Lt. (Dec. 24, 1940).

The follg. P/Os. are promoted to war substve. rank of F/Os.:—(Jan. 19) R. C. Skellon, E. G. Spearing; (Mar. 24) N. R. Peel.

P/O. on probn. R. W. Linnitt is promoted to rank of F/O. on probn. (Jan. 12).

The follg. are transfd. to Technical Branch (Apr. 24, 1940):—Wing Cdrs.: V. Rees, J. A. S. Outhwaite. Sqn. Ldrs.: J. B. Altham, H. B. Collins.

F/O. J. A. E. Monette relinquishes his short service commn. on account of ill-health (Mar. 25).

Technical Branch.

The follg. are granted commns. for duration of hostilities as F/Os. on probn.:—W/Os.: (Nov. 24, 1940) H. Dewhurst; (Feb. 1) C. R. Trevett. As Act. P/Os. on probn.:—Flt. Sgts.: Feb. 28, sen. Nov. 19, 1940) K. F. Batt; (Feb. 28, sen. Nov. 12, 1940) W. R. Bray; (Feb. 28, sen. Nov. 20, 1940) W. H. Cox, D. E. Gibbs; (Feb. 28, sen. Nov. 5, 1940) F. A. Harris; (Feb. 28, sen. Nov. 19, 1940) A. H. Lodge; (Feb. 28, sen. Nov. 12, 1940) F. W. Morris; (Feb. 28, 1940, sen. Nov. 20, 1940) R. F. Nice; (Feb. 28, 1940, sen. Nov. 13, 1940) L. G. Raspison; (Feb. 28, 1940, sen. Nov. 15, 1940) H. J. Roberts; (Feb. 28, 1940, sen Nov. 19, 1940) G. Robson; (Feb. 28, 1940, sen. Nov. 13, 1940) W. J. Scholes; (Feb. 28, 1940, sen Nov. 21, 1940) E. F. C. Worthy; (Feb. 28, 1940, sen. Nov. 18, 1940) P. C. Wright; (Mar. 3) L. R. Hay. Sgts.: (Feb. 28) M. G. Hunn, J. A. Nicholls, G. J. Pearn, I. M. Ritchings, L. C. Sykes, E. S. Williams.

The follg. Act. P/Os. on probn. are graded as P/Os. on probn.:—(Nov. 6, 1940) J. E. Barber; (Dec. 6, 1940) T. F. Kyle.

The follg. promotions are made with effect from Dec. 1, 1940):—Sqn. Ldr. to be Wing Cdr. (temp.): H. B. Collins. Flt. Lt. to be Sqn. Ldr. (temp.): R. J. Kemsley.

F/O. H. H. Laurie is granted war substve. rank of Flt. Lt. (March 28, 1940) (substd. for notifn. of Oct. 8, 1940).

Administrative and Special Duties Branch.

The follg. are granted commns. for duration of hostilities as F/Os. on probn.:—W/Os.: (Mar. 3) J. W. Burley; (Mar. 4) A. E. Ubee; (Mar. 5) H. Whalley, S. Compton; (Mar. 7) W. E. Thorpe. As P/Os. on probn.:—W/Os.: (Feb. 24) W. Brereton; (Mar. 4) F. L. Braithwaite; (Mar. 5) H. J. Robinson; (Mar. 7) E. G. Slaney. Flt. Sgt.: (Mar. 3) R. M. Holliday. As Act. P/O. on probn.:—Act. W/O.: (Mar. 7) C. F. Edwards. Flt. Sgt.: (Feb. 28) A. D. Crompton. Sgts.: (Feb. 28) E. A. Challis; (Mar. 7) A. Vicary. Cpl.: (Mar. 7) C. Dewar.

Act. P/O. on probn. V. A. Nicolls is graded as P/O. on probn. (Nov. 9, 1940).

P/O. on probn. R. S. Sweetlove is promoted to war substve. rank of F/O. on probn. (Nov. 11, 1940).

The follg. P/Os. on probn. are transfd. to Technical Branch (Sept. 9, 1940):—J. G. Portlock, F. W. A. Flanigan.

Equipment Branch.

Act. P/O. on probn. K. G. Baker is graded as P/O. on probn. (Feb. 22).

The short service commn. of P/O. on probn. B. McA. Hodge is terminated on cessation of duty (Mar. 6).

Accountant Branch.

P/O. D. H. Mortimore is confirmed in his appt. (Apr. 17, 1940) and granted war substve. rank of F/O. (Dec. 5, 1939) (substd. for notifn. of June 18, 1940).

The follg. Act. P/Os. on probn. are graded as P/Os. on probn:—(Dec. 13, 1940) A. A. Radford; (Jan. 24) J. H. Cook.

Princess Mary's R.A.F. Nursing Service

The follg. Sisters resign their appts.:—(Feb. 28) Miss B. J. Hutchinson; (Mar. 3) Miss E. A. Frazer; (Mar. 18) Miss K. P. Gamble.

Royal Air Force Reserve

RESERVE OF AIR FORCE OFFICERS.

General Duties Branch.

Sqn. Ldr. F. S. Wakeham is promoted to rank of Wing Cdr. (temp.) (Mar. 1).

The follg. F/Os. are promoted to war substve. rank of Flt. Lt.:—(Sept. 3, 1940) W. J. Alington (substd. for notifn. of Nov. 19, 1940); (Jan. 6) T. W. Hamlin; (Feb. 21) W. H. L. Dudley; (Mar. 23) E. G. B. Reid, D. J. A. Roe, D.F.C.

F/O. H. H. Ellison is transfd. to Technical Branch (Apr. 24, 1940).

Sqn. Ldr. W. J. Ryan, C.B.E. (Wing Cdr., R.A.F., Ret.), relinquishes his commn. in class CC on re-employment with R.A.F. (Apr. 15, 1940).

The follg. relinquish their commns. in class CC:—Flt. Lt.: (Feb. 24) E. A. K. Crossfield, M.C. F/O.: (Mar. 17) L. R. Butters.

Sqn. Ldr. G. E. Jackson, D.F.C., relinquishes his commn. on appt. to a comm. in the Indian Army (Unattached List) (Jan. 15).

The follg. relinquish their commns. on appt. to commns. in R.N.V.R. (July 16, 1940):—Flt. Lts.: J. B. W. Pugh, J. M. Waddell. F/Os.: G. H. G. S. Rayer, J. M. Israel.

The notifn. of June 25, 1940, concerning Sqn. Ldr. W. J. Ryan, C.B.E., is cancelled.

Technical Branch.

F/O. C. C. Gissing is promoted to war substve. rank of Flt. Lt. (Apr. 24, 1940).

Equipment Branch.

Sqn. Ldr. H. W. Allen is dismissed the Service by sentence of General Court Martial (Mar. 13).

Royal Air Force Volunteer Reserve

General Duties Branch.

H.R.H. Bernhard Leopold, Prince of the Netherlands, is appt. Hon Air Comdre. (Mar. 14).

The follg. are granted commns. for duration of hostilities as Flt. Lt.:—(Jan. 6) J. H. Saffery. As P/Os. on probn.:—(Feb. 28) R. M. Dixon. Sgts.: (Feb. 7) W. L. Davis; (Feb. 14) J. D. Fletcher; (Feb. 24) R. N. Stubbs; (Mar. 1) H. E. Trumper, L. W. H. Welch; (Mar. 2) W. A. B. Martin; (Mar. 3) W. F. J. Harwood; (Mar. 4, sen. Nov. 6, 1940) K. N. Burnham; (Mar. 5) F. Symmons, D.F.M., S. H. Fox, D.F.M.; (Mar. 9) W. B. Adams, C. R. Barrett, G. A. Ings, E. E. Rodley. L.A/C.: (Dec. 1, 1940) D. F. A. M. Balfour, W. L. Cox; (Dec. 17, 1940) J. G. Shepherd; (Dec. 29, 1940) D. MacGregor; (Jan. 20) W. J. de L'A. Buchan; (Feb. 1) D. M. Foreman, D. P. Fox, R. V. G. Frandsen; (Feb. 5) W. L. Tweedie; (Feb. 11) F. G. Stokes, J. G. Toplis; (Feb. 12) A. W. Carvell, J. D. Fox, M. R. Jenkin, K. M. Jones, B. J. Parker, R. W. Waine, A. Whitten-Brown; (Feb. 16) A. C. Abbott, P. G. Bell, D. M. Bolton, P. M. Boan, J. A. G. Cornelius-Wheeler, J. N. Davies, M. J. Horsey; (Feb. 19) E. Andrews, J. F. Kelham, P. Landers, W. R. A. Walters; (Feb. 20) J. E. Canning; (Feb. 24) W. G. Rowse, R. D. Doleman; (Feb. 28) G. R. Muirhead; (Mar. 2) V. B. Dewhurst, P. A. Goode, H. H. K. Gunnis, A. Sabine, F. W. Selfe, A. E. Wilson. As Act. P/O. on probn.:—(Feb. 28) R. R. Thomson.

The follg. P/Os. on probn. are confirmed in their appts. and promoted to war substve. rank of F/O.:—(Dec. 1, 1940) F. J. Hartnell-Beavis; (Jan. 23) L. C. Edwards; (Feb. 4) H. Jones.

Act. P/O. R. G. Sollars is graded as P/O. (July 5, 1939).

The follg. F/Os. are promoted to war substve. rank of Flt. Lt.:—(Mar. 17) C. N. Foxley-Norris, F. J. French, C. M. Howell, J. F. Inkster, M. T. Judd, G. C. Knowles, J. K. Lawrence, C. B. Martindale, C. R. McL. Petley; (Mar. 23) J. A. S. Hodgson.

The follg. P/Os. are promoted to war substve. rank of F/O.:—(Aug. 24, 1940) J. W. Stewart; (Dec. 21, 1940) P. Harding; (Jan. 13) R. G. Sollars; (Jan. 20) K. G. S. Smith; (Feb. 16) D. F. Walker.

P/O. D. R. Smith-Bingham is granted war substve. rank of F/O. (Feb. 18, 1940).

The follg. P/Os. on probn. are transfd. to Administrative and Special Duties Branch:—(Oct. 27, 1940) I. C. Rushton (substd. for notifn. of Nov. 5, 1940); (Mar. 10) R. E. Spray; (Mar. 15) W. Mailer; (Mar. 18) A. N. Stratton.

The notifn. of Mar. 7 concerning P/O. on probn. A. Payze is cancelled.

Technical Branch.

The follg. are granted commns. for duration of hostilities as P/O. on probn.:—Act. W/O.: (Feb. 14) J. F. Lucas. As Act. P/Os. on probn.: (Feb. 28) J. E. Buchanan. Flt. Sgt.: (Feb. 28, sen. Nov. 11, 1940) B. D. F. Austen. Sgts.: (Feb. 28, sen. Nov. 20, 1940) R. W. C. Mills; (Feb. 28, sen. Nov. 14, 1940) N. R. Parry. Cpl.: (Feb. 28) G. A. G. Saywell.

Act. P/O. on probn. F. Inchley is graded as P/O. on probn (Feb. 17).

The follg. P/Os. are granted was substve. rank of F/O.:—(Sept. 12, 1940) W. J. Reason; (Jan. 10) S. A. Cox.

Balloon Branch.

Cpl. C. J. Curtis is granted a comm. for duration of hostilities as P/O. on probn. (Mar. 10).

The follg. P/Os. on probn. are confirmed in their appts. and promoted to war substve. rank of F/O.:—(Nov. 8, 1940) D. H. G. Richardson; (Dec. 7, 1940) S. Smith; (Feb. 17) O. S. Todd; (Feb. 26) G. N. Holtby, H. D. Morton; (Mar. 4) R. A. Etherington; (Mar. 26) F. Q. Davis.

Erratum.

In notifn. of Mar. 14 concerning F/O. J. F. Lemming. *For* Lemming *read* Leeming.

Administrative and Special Duties Branch.

Flt. Lt. M. R. Edmondes is granted a comma. as Flt. Lt. (Aug 1, 1940, sen. Mar. 1, 1932).

The follg. are granted commns. for duration of hostilities as P/Os. on probn.:—(Feb. 23, 1940) R. Foster; (July 22, 1940) C. P. Cowper; (Oct. 14, 1940) S. J. Robinson; (Dec. 9, 1940) J. P. Carlile; (Dec. 20, 1940) P. W. Lomax; (Jan. 1) C. F. Blair, B. J. Lavers; (Jan. 22) G. W. H. Waters; (Feb. 1) C. W. Pickering; (Feb. 2) G. N. Paxton; (Feb. 5) C. C. Davies; (Feb. 7) C. E. Dell, W. G. Corbishley; (Feb. 12) J. M. Billans, C. A. S. Foulkes, A. J. Silver; (Feb. 14) H. S. K. Stapley; (Feb. 15) A. G. Walker; (Feb. 21) L. Barnett, J. L. Bond; (Feb. 24) A. T. Smith; (Feb. 25) G. E. Scott; (Feb. 26) R. S. Hinder, J. G. Ogilvie, T. D. Weatherhead; (Feb. 27) G. W. Dimbleby, G. Whittle; (Feb. 28) S. E. Carlton, G. R. M. Cooper, H. R. Hollway, G. V. L. Humphreys, J. C. Hutchinson, A. W. Ireland, A. Marsh, H. C. Mayall, H. S. McLean, E. C. L. Nichols, R. E. Pickett, V. Priestwood, A. G. Roberts, E. S. Robson, F. J. P. Shaw, A. Shepherd, D.F.M., D. P. Story, V. B. B. Watford; (Mar. 1) E. J. Barker, G. B. Blaker, F. W. Cronne, H. A. Eve, N. A. Horlock, F. H. La Trobe, M.C., T. Millar, G. F. Oppenheimer, A. N. W. Pye, H. H. Rignold, H. Robinson; (Mar. 3) H. W. Badger; (Mar. 7) R. M. Marsh; (Mar. 8) E. W. Wilkinson; (Mar. 10) R. E. Bagwell, S. M. Day, W. G. Faires, L. J. Gould, P. J. Harris, G. Irving, J. A. Jones, S. C. L. Taggart, S. A. Walker, S. Wiseman. As Act. P/Os. on probn.:—Sgts.: (Feb. 21) A. Richardson; (Feb. 28) R. V. Motley; (Mar. 7) F. A. V. Stoltz. Cpls.: (Feb. 28) O. W. Rawes, J. P. Hitchin; (Mar. 7, sen. Nov. 13, 1940) G. A. P. Griffiths, (Mar. 7) G. W. Harris, H. E. Todd, A. V. Earnshaw. L.A/C.: (Feb. 28) G. C. Harkus, G. H. Matthews, E. A. Walker, J. Cadell; (Mar. 7) P. Brentnall, S. R. Palmer. A/C.1: (Feb. 28) H. B. Moss, M.C., H. G. Blakeney, Flynn, R. K. Cooke, J. D. Frampton; (Mar. 7) E. Royceton. A/C.2: (Feb. 28) J. H. Jamieson, P. R. A. Armstrong; (Mar. 1) J. B. Aitken; (Mar. 7) G. W. Addison, E. Evans, D. E. Cottrell P. N. Davey, T. K. Davies, M. J. Griffiths, G. W. Hogg, N. Lawrence, W. A. Brown, W. F. Matthew.

The follg. P/Os. on probn. are confirmed in

WITH HOOK AND SINKER: An intimate shot of a Fairey Albacore with torpedo fitted. The deck landing hook is retracted into the fuselage.

SERVICE AVIATION (Continued)

their appts and promoted to war substve. rank of F/O.:—(Oct. 10, 1940) G. N. Blundell; (Jan. 24) E. G. Pearson; (Jan. 26) C. F. M. Burry, J. D. Frame, A. F. J. H. Keep; (Feb. 13) T. A. Lloyd; (Feb. 22) E. M. Edlin; (Feb. 23) W. G. Giles; (Feb. 26) D. W. Bridge; (Mar. 2) N. D. Williams; (Mar. 8) B. M. Davison; (Mar. 17) A. H. Partner.

P/O. G. W. Hignett is confirmed in his appt. Dec. 10, 1940, and granted war substve. rank of F/O. (June 1, 1940). (Substd. for notifn. of Feb. 14.)

P/O. Lord P. F. A. Brownlow is confirmed in his appt. Oct. 18, 1940, and granted war substve. rank of F/O. (Feb. 1, 1940).

The follg. Act. P/Os. on probn. graded as P/Os. on probn.:—(Oct. 29, 1940) L. J. Cuxwell; (Nov. 4, 1940) E. M. Saunders; (Nov. 8, 1940) F. M. Naylor; (Nov. 29, 1940) R. J. Madill; (Dec. 7, 1940) D. J. Everett; (Dec. 9, 1940) B. Sims; (Dec. 14, 1940) H. W. M. Telling; (Jan. 7) S. G. Thompson; (Jan. 10) N. T. Helme; (Jan. 25) S. S. Tiernan; (Jan. 17) H. R. Oughton.

The follg. P/Os. are granted war substve. rank of Flt. Lt.:—(Jan. 7, 1940) D. Grant; (Jan. 19, 1940) J. S. Ward; (Oct. 16, 1940) H. R. W. Hogg, C.I.E., O.B.E.

The follg. P/Os. are granted war substve. rank of F/O.:—(Sept. 9, 1940) T. Harris; (Feb. 2, 1940) R. Williamson; (May 2, 1940) J. G. E. Borne, D. B. Stampton; (Oct. 3, 1940) R. S. Modie; (Dec. 30, 1940) C. De W. Taylor, M.C.; (Jan. 14) J. E. Bembaron.

The follg. are transfd. to Technical Branch:—Flt. Lt.: (Dec. 21, 1940) M. R. Edmondes. F/Os. on probn.: (Nov. 11, 1940) L. C. Munn; (Dec. 16, 1940) F. E. T. Clark. P/O.: (Sept. 17, 1940) G. E. B. Christie; (Oct. 25, 1940) D. H. Bacon; (Oct. 28, 1940) F. C. Bradley, H. A. Hewat. P/Os. on probn.: (Apr. 24, 1940) G. T. Dain, C. Tinker (since promoted); (June 22, 1940) G. K. Whetstone; (July 16, 1940) A. C. Gray; (July 22, 1940) J. T. Woodmass; (Aug. 11, 1940) G. M. Fossick; (Sept. 9, 1940) J. E. Buckland; (Sept. 28, 1940) S. F. Darby, C. L. E. Geach, A.F.C.; (Oct. 1, 1940) J. T. Dickinson; (Oct. 2, 1940) I. Croshaw; (Oct. 3, 1940) R. C. B. Swaine; (Oct. 11, 1940) T. Clark; (Oct. 23, 1940) K. W. Edwards; (Oct. 24, 1940) R. A. E. Ellis, J. A. Strang; (Oct. 28, 1940) F. D. Elworthy, H. E. Byrom; (Nov. 24, 1940) N. K. Dyson, E. G. Abercromby; (Nov. 25, 1940) W. W. Gardam; (Dec. 7, 1940) M. A. Vernon; (Jan. 19) H. F. Viney; (Feb. 2) A. H. Bibby.

P/O. on probn. D. W. Kirk is transfd. to Equipment Branch (Mar. 11).

F/O. F. S. Bowles is transfd. to Accountant Branch (Feb. 22).

The follg. relinquish their commns. on account of ill-health:—Flt. Lt.: (Mar. 22) R. H. W. Bundle. F/O. on probn.: (Mar. 25) N. S. Little. P/O. on probn.: (Mar 22) C. T. Smith.

The follg. P/Os. on probn. resign their commns.:—(Jan. 26) S. J. Robinson; (Feb. 12) H. V. Budgen; (Mar. 5) J. G. Espie; (Mar. 9) J. Carleton.

The comms. of the follg. P/Os. on probn. are terminated on cessation of duty:—(Jan. 26) H. W. Lester (substd. for notifn. of (Feb. 21); (Feb. 1) T. Golman; (Mar. 1) A. S. Brierley, D. E. McCaghey.

P/O. A. J. Corbitt is dismissed the Service by sentence of General Court-Martial (Mar. 13).

The notifn. of Feb. 4 concerning P/O. A. Cave is cancelled.

Training Branch.

The follg. are granted commns. for duration of hostilities as Act. P/Os. on probn.:—(Feb. 1) R. H. Ackerley, W. Adams, S. G. Aston, A. Barr, S. A. Bee, E. G. Begg, J. E. Bishop, W. C. C. Blacklord, R. P. Bostock, B. A. Bradford, C. N. Broomhead, A. L. Brown, J. H. Brown, C. D. Buckle, C. H. Burge, G. F. Burns, H. S. Burrows, B. A. Butt, L. S. Clarke, L. G. Clifford, J. C. Cousins, G. E. Cree, M. E. Crosland, J. A. Cruise, F. Dallow, G. C. Diamond, J. E. Dobson, F. F. Dutton, A. L. Dyson, J. Eaton, B. Ecroyd, F. G. Elliott, J. M. Farquharson, G. W. Farrand, J. Forshaw, C. A. Freestone, C. G. Gowing, J. Green, F. Grimshaw, S. Grimshaw, P. Hampton, J. Hart, W. N. Herd, F. S. Heywood, R. C. Hirst, H. S. Inman, H. Ireland, M. F. S. Jewell, F. L. Jones, L. H. T. Jones, G. Keeley, W. S. Ker, F. Lawton, H. N. Lee, G. A. Lodge, A. A. L. Miller, R. A. Mull, R. A. Myers, W. F. Mytton, F. Nicholson, S. J. Noel Brown, C. C. F. Osborn, A. W. Payne, J. A. Peacock, A. H. Pharaoh, H. B. Priestley, B. C. J. Rickard, F. V. Rolfe, H. V. Rutherford, C. A. Sharpe, W. Simpson, L. J. Snape, L. H. Starkey, P. P. L. Stevenson, C. H. Stocks, H. M. Thompson, J. C. Thompson, D. H. Wade, E. Walker, P. F. Williams, W. T. Wilson; (Feb. 14) J. L. Smeall; (Feb. 19) R. B. Calder, F. C. Lay; (Feb. 21) C. Davies, G. C. Gibson, E. J. Jacobs, H. Pickles, L. G. Richards, H. Rolfe, H. Vanstone; (Feb. 22) W. C. Mitchell, G. P. Smith; (Feb. 27) B. Durant, A. H. Howlett, C. N. Jackson, E. S. Kendall, W. E. Matthews, K. G. Reynolds, A. McN. Smallwood, H. J. B. Stace, E. Williams; (Feb. 28) L. E. Britnor, A. H. Chadder, A. E. Filsell, G. H. Grattan-Guinness, T. L. Stoddard; (Mar. 4) J. Anderson, A. W. Angus, D.S.O., W. H. S. Aplin, W. C. Biddle, C. H. P. Bond, J. L. Chalmers, M.C., W. T. Curtis-Wilson, J. G. Davies, H. L. Deacon, T. Dean, W. F. Dickson, R. E. Harrison, H. E. Francis-Stead, M. V. Gregory, F. J. Hulme, J. A. Ingleby, J. E. Johnston, W. R. Jones, C. F. Lane, J. L. Latimer, A. H. Laverty, C. C. Learmonth, V. P. Mackay, W. D. Mackay, A. Mackenzie, D. H. J. Marchant, R. W. L. Melbourne, C. W. Murray, D.F.C., T. M. Phillips, T.D., H. M. Pyke, J. Quinton, S. P. Rust, R. C. Smart, R. T. Sumner, C. H. Thorp, G. Viccars, A. Walker, H. J. Walkerdine, J. W. Watts, C. H. Weir, C. A. N. Yates; (Mar. 7) T. C. S. Bullick C. H. Gilkes, E. B. Gordon, J. E. Havis, D. McCreadie, K. T. O'Brien; (Mar. 8) J. R. N. Booth, R. Borthwick, W. M. T. Branson, A. H. Bruce, R. E. M. Coombes, J. H. Fairchild, A. E. Firmin, A. L. Flowerdew, W. H. Fluck, J. E. Forrest, D. Grant, G. J. Harter, J. A. Herron, J. Holburn, W. E. Kelsey, R. W. MacAdam, J. W. Macdonald, M. McManus, C. E. Marshall, J. E. G. Mosby, R. Neil, H. J. Nursey, E. J. Parrish, A. J. Price, A. H. Purser, A. N. S. Ranson, A. A. Rice, J. Shanks, C. B. Smith, A. W. Steward, C. P. Tutt, G. H. Willows; (Mar. 9) F. N. S. Creek, M.C., F. F. Crossley, A. Davies, W. W. Gladieg, O. P. Hills, H. Howe, H. P. Nangle, H. A. C. Perkins, F. F. Scott, F. T. Williams, O. Wilson; (Mar. 10) B. A. Farr, A. R. Gooderson, R. C. Lyness, H. W. Sleep, S. F. Thrasher, A. H. Watts; (Mar. 11) F. Tyler, G. T White; (Mar. 12) F. Copeland, N. J. Mawby, A. E. Rose, L. R. Taylor.

Equipment Branch.

P/O. on probn. R. V. Gray is confirmed in his appt. Sept. 18, 1940, and promoted to war substve. rank of F/O. (Feb. 12).

The follg. P/Os. on probn. are confirmed in their appts. (Nov. 9, 1940) and promoted to war substve. rank of F/O.:—(Jan. 8) Sir N. H. Pringle, Bart.; (Jan. 15) L. E. Nicholls; (Jan. 20) S. H. Trott; (Jan. 22) C. C. Worsdell; (Feb. 7) A. C. Featherstone.

The follg. P/Os. on probns. are confirmed in their appts. (Nov 21, 1940) and promoted to war substve. rank of F/O.:—(Jan. 20) R. P. R. Sangster; (Jan. 30) H. E. Richardson; (Feb. 2) P. T. Sutton, M. N. J. Wombwell; (Feb. 7) C. F. Burgess, H. W. A. Clifford, H. M. Heywood, D. H. Papps, J. D. Watford.

The follg. Act. P/Os on probn. are graded as P/Os. on probn.:—(Nov. 25, 1940) J. D. Morris, C. G. Walton; (Feb. 22) E. J. Bindloss, J. Freeman, N. B. Inman, J. Macfarlane, N. W. Pendleton, R. A. Sandison, P. H. F. Tebbutt, E. R. M. Townsend, J. C. Woollard, C. G. Dexter, A. C. Morris, T. G. O'Neill.

F/O. H. A. Jorlan is promoted to rank of Flt. Lt. (temp.) (Mar. 1).

Act. P/O. on probn. F. W. A. Cuningham is transfd. to Administrative and Special Duties Branch (Mar. 16).

Accountant Branch.

The follg. are granted commns. for duration of hostilities as Act. P/Os. on probn. (Mar. 7):—F. W. Anderson, H. W. Andrews, H. M. Barrett, C. M. Bramwell, T. J. Bucher, R. S. Buckle, W. Burtt-Jones, J. H. Croydon, R. A. Davies, R. R. Dewing, B. A. Draper, E. W. Field, H. Jagger, A. E. A. MacKenzie, F. Netherwood, M. Tell.

Sgt.: H. Richardson. L.A/C.: H. L. Turk. A/C.2: G. P. Thomas.

P/O. on probn. E. C. White is confirmed in his appt. (Nov. 28, 1940) and promoted to war substve. rank of F/O. (Feb. 4).

The follg. Act. P/Os on probn. are graded as P/Os on probn.:—(Jan. 24) H. W. Norman; (Feb. 15) A. R. G. Cunningham, F. L. Wake; (Feb. 23) K. A. Edwards, U. C. Moore.

Medical Branch.

The follg. are granted commns. for duration of hostilities:—As Flt. Lt.: (Feb. 18) F. J. Lorriman, M.D., B.S., D.O.M.S. As F/Os.: (Feb. 18) K. G. Eckersley, M.R.C.S., L.R.C.P., T. Gray, M.B., Ch.B., G. D. Graham, M.B., B.Chir., M.R.C.S., L.R.C.P., G. Clayton, M.R.C.S., L.R.C.P., J. Wishart, M.B., Ch.B., C. R. B. Welford, B.M., B.Ch., P. H. Sutton, M.B., B.S., M.R.C.S., L.R.C.P., G. V. Steward, M.B., B.Ch., M.R.C.S., L.R.C.P., H. J. Richardson, L.R.C.P. & S. L.R.F.P.S., D. N. Kiff, M.B., Ch.B., C. W. L. Macnamara, M.B., B.Ch., R. G. S. Meadley M.B., Ch.B., T. M. Prosser, L.R.C.P. & S., L.R.F.P.S., G. R. Bernard, M.B., Ch.B., J. H. Bell, M.B., Ch.B., G. H. Scott, M.B., B.S., J. M. Black, M.B., Ch.B., W. E. Bamford, M.B., B.Ch., W. B. D. Maile, M.B., B.Chir., M.R.C.S., L.R.C.P., N. J. Jackson, M.B., B.S., D. Crichton, M.B., Ch.B., A. P. Macdonald, M.B., Ch.B.

The follg. F/Os are promoted to war substve. rank of Flt. Lt.:—(Feb. 6) D. C. Moore M.R.C.S., L.R.C.P.; (Feb. 20) W. Begg, M.B., Ch.B.; (Feb. 27) P. D. Samman, M.B., B.Chir.; (Mar. 5) R. H. Moore, M.B., B.Ch.

F/O. A. F. Baldwyn, M.B., B.S., ceases to be seconded to St. Bartholomew's Hospital (Feb. 11).

Dental Branch.

The follg. are granted commns. for duration of hostilities as F/Os.:(Jan. 17) G. T. Witherwick, L.D.S., G. Hardy, B.D.S., R. C. S. Willis, L.D.S., L. K. A. S. Oxley, L.D.S., C. Hogg, L.D.S., P. H. Staple, B.D.S., F. C. Johnstone, L.D.S., V. E. Ireland, L.D.S., S. S. Gill, L.D.S., H. G. Griffith, B.D.S., J. B. Hine, L.D.S.; (Feb. 7) H. N. Stewart, L.D.S.; (Feb. 18) A. W. Fisher, L.D.S., L. C. Lavender, L.D.S., H. Richards, L.D.S., L. R. Brownlee, L.D.S., H. F. Vere, B.Sc., L.D.S., A. S. Bedford, L.D.S., A. W. J. West, L.D.S., A. W. Jackson, L.D.S., R. I. H. Whitlock, L.D.S., J. W. S. Jenkins, L.D.S. W. S. Baird, L.D.S., G. W. Pollard, L.D.S., C. R. Cornish, L.D.S., R. H. Hamlyn, L.D.S., P. J. Carter, L.D.S. W. Elgey, L.D.S., D. D. Mears, L.D.S., D. G. Johnston, L.D.S.

The follg. F/Os. are promoted to war substve. rank of Flt. Lt.:—(Nov. 6, 1940) R. M. H. Gemmell, L.D.S.; (Feb. 28) F. G. Hollier, L.D.S.

Chaplain's Branch.

The follg. are granted commns. for duration of hostilities with relative rank of Sqn. Ldr.:—(Jan. 4) Rev. P. E. Hull; (Jan. 21) Rev. J. M. Milne, M.A., B.D.; (Feb. 4) Rev. D. H. Pottie; (Feb. 10) Rev. W. C. Newsome; (Feb. 12) Rev. E. M. Hughes, B.D.; (Feb. 18) Rev. J. Fisher; (Feb. 25) Rev. J. E. W. Connolly, Rev. J. B. Pattison, Rev. B. F. J. Plumley, Rev. F. W. Hill, D.Phil., Rev. C. A. Madden; (Mar. 4) Rev. N. M. Slaughter, M.A., B.D.

PIN-MONEY PARADE. If there's one parade that no soldier ever tries to dodge its the weekly pay parade and there's no reason to suppose that the girls of the W.A.A.F. are any less human. Here we see some of them at a balloon barrage depot drawing their well-earned pin-money at the week-end.

Auxiliary Air Force

Balloon Branch.

Sqn. Ldr. E. J. Richmond relinquishes his comm. on account of ill health (Mar. 22).

Administrative and Special Duties Branch.

P/O. A. Wallace is promoted to war substve. rank of F/O. (Nov. 29, 1940)

Auxiliary Air Force Reserve of Officers

F/O. A. L. Maffey is promoted to war substve. rank of Flt. Lt. (Feb. 26).

Women's Auxiliary Air Force

The follg. are apptd. Assist. S/Os. (Mar. 15):—Cpl. B. M. Adams, A/C/W.2 K. M. Duke, A/C/W.1 J. M. Macivor, A/C/W.2 P. E. Messenger, A/C/W.2 D. Pepys, Cpl. P. E. Ricketts.

The follg. Assist. S/Os. relinquish their appts.:—(Dec. 7, 1940) M. E. Long; (Jan. 3) M. L. Strong; (Feb. 15) B. W. Longford; (Mar. 5) C. M. Safer Whitburn; (Mar. 7) J. B. Orr; (Mar. 12) H. S. Fleming; (Mar. 16) D. V. Durno

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